Vol. 1068 — number 4

# OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Please tie

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 25, 1983 Volume 1026 Number 4


## CONTENTS


| | Page |
|---|---|
| Patent and Trademark Office Notices | |
| Patent Cooperation Treaty (PCT) Information | 1026 OG 294 |
| Reissue Applications Filed | 1026 OG 294 |
| Requests For Reexamination Filed | 1026 OG 294 |
| National Inventors Day | 1026 OG 294 |
| PTO Status | 1026 OG 295 |
| Patent Certificates of Correction | 1026 OG 296 |
| Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries | 1026 OG 297 |
| Condition of Patent Applications | 1026 OG 298 |
| Reexaminations | 1026 OG 299 |
| Reissue Patents Granted (31,130) | 1027 |
| Plant Patents Granted (4,977) | 1029 |
| Patents Granted | |
| General and Mechanical (4,369,526) | 1031 |
| Chemical (4,370,141) | 1245 |
| Electrical (4,370,509) | 1341 |
| Design Patents Granted (267,674) | 1425 |
| Index of Patentees | PI 1 |
| Indices of Reissue, Reexamination, Design and Plant Patentees | PI 45 |
| Classification of | |
| Patents (Including Reissues and Reexaminations) | PI 49 |
| Designs and Plants | PI 51 |
| Geographical Index of Residence of Inventors | |
| Patents (Including Reissues) | PI 52 |
| Designs and Plants | PI 53 |
| Change of Address Form and Subscription Order Form | Back Page |



The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

| | |
|---|---|
| Transmittal fee | $ 125.00 |
| Search fee | |
| U.S. Patent and Trademark Office as Searching Authority | |
| · No corresponding prior U.S. national application filed | 500.00 |
| · Corresponding prior U.S. national application filed | 250.00 |
| European Patent Office as Searching Authority | |
| · All cases | 670.00 |
| International Fees | |
| Basic Fees (first 30 pages) | 265.00 |
| Basic Supplemental Fee (for each page over 30) | 5.00 |
| Designation fee (for each national or regional office) | 65.00 |

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

---

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,454,226,** Re. S.N. 413,134, Filed Aug. 30, 1982, Cl. 239/224, ATOMIZER WHEEL FOR THE ATOMIZATION OF SUSPENSIONS OF HARD-WEARING MATERIALS, Kaj Nielsen, Owner of Record: *Inventor,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 313

---

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**No Publications This Issue.**

---

### National Inventors Day

The Patent and Trademark Office and the National Council of Patent Law Associations will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 12, 1983, from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 13, 1983, from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 11, 1983, at 5:00 p.m. The removal of all personal property from the Search Room by the early closing time would be appreciated.

GERALD J. MOSSINGHOFF,
Nov. 12, 1982. *Commissioner of Patents and Trademarks.*

### Status of PTO Services

The following is an update of the status of PTO services as of Jan. 3, 1983:

| Service Item | FY 1983 Performance Goal (Calendar Days) | Actual | Comment |
|---|---|---|---|
| Filing Receipts: | | | |
| Patents | 22 | 46 | Reduced by 10 days in the past month. |
| Trademarks | 30 | 92 | Delays continue due to extremely large number of applications filed during September. |
| Patent Copies: | | | |
| Window Coupons | 5 | 81% within 5 days | Problems encountered in the initial phase of implementing an automated control system are being overcome. |
| Mail Coupons* | 29 | 97% within 29 days | |
| Letter Orders* | 34 | 99% within 34 days | |
| Certified Copies: | | | |
| Trademark Registrations | 30 | 18 | |
| Applications-As-Filed | 20 | 100% within 20 days | |
| File-Wrapper/Contents | N/A | 100% within 15 days | |
| Walk-up Certification | 1 | 99% within 1 day | |
| Trademark Search Library: | | | |
| Filing Drawings | 21 | 93 | Delays continue due to extremely large number of applications filed during September. |
| Filing Reg. Certificates | 3 | 3 | |
| Assignments | | | |
| Patents | 15 | 57 | Goals and the method of computing actual time are being revised. |
| Trademark | 21 | 93 | Goals and the method of computing actual time are being revised. |
| Patent Official Gazette | | | |
| In Bookstore | Issue Date | On Schedule | |
| Mailed | Issue Date | Avg. 1/2 day late | |
| Patent Grants Mailed | Issue Date | 2 days late | |
| Patent Copies Available | Issue Date | 75% | 90% available by day after Issue Date. |
| Trademark Official Gazette | | | |
| In Bookstore | Issue Date | On Schedule | |
| Mailed | Issue Date | Avg. 3 days late | Dec. 7 issue was 8 days late due to GPO's problems; now back on schedule. |
| Trademark Regs. Mailed | Issue Date | 1 day late | |

*Goal now includes mail processing and delivery time. A recent survey of mail delivery time for these services yielded the fact that the *average* amount of time required for one-way delivery is seven calendar days. Therefore the prior goal was increased by 14 days to reflect average time from mailing by requestors to receipt of copies.

**IMPROVEMENTS TO SERVICES**

- *Use of Deposit Accounts*—Effective immediately, the Crystal Plaza certification desk, located in the Public Search Room, will accept the use of deposit accounts for certification services. If a deposit account is to be charged, the Deposit Account Order Form, PTO 140, should be used. In addition, the hours of service for the desk have been extended to cover the normal office hours of 8:30 a.m.—5:00 p.m., Monday through Friday.
- For other improvements made in services, see the Official Gazettes for Oct. 26, Nov. 30, and Dec. 28, 1982.

THERESA A. BRELSFORD,
*Assistant Commissioner for Administration.*

Jan. 3, 1983.

# PATENT NOTICES

**Certificates of Correction for the Week of Jan. 25, 1983**

| | | | |
|---|---|---|---|
| D. 266,587 | 4,318,755 | 4,342,021 | 4,352,318 |
| 3,853,099 | 4,318,801 | 4,342,047 | 4,352,453 |
| 4,099,246 | 4,320,602 | 4,344,187 | 4,352,576 |
| 4,123,441 | 4,322,365 | 4,344,964 | 4,353,369 |
| 4,217,389 | 4,322,517 | 4,344,979 | 4,353,619 |
| 4,233,433 | 4,322,526 | 4,345,087 | 4,354,276 |
| 4,258,161 | 4,324,858 | 4,348,301 | 4,354,357 |
| 4,261,894 | 4,325,755 | 4,348,323 | 4,354,942 |
| 4,272,362 | 4,329,736 | 4,348,499 | 4,355,287 |
| 4,277,591 | 4,331,277 | 4,348,623 | 4,355,443 |
| 4,283,710 | 4,331,785 | 4,348,783 | 4,355,692 |
| 4,292,592 | 4,332,098 | 4,348,802 | 4,355,909 |
| 4,301,694 | 4,333,366 | 4,348,990 | 4,356,548 |
| 4,302,946 | 4,334,267 | 4,349,421 | 4,357,497 |
| 4,303,850 | 4,334,935 | 4,349,553 | 4,358,538 |
| 4,310,130 | 4,336,426 | 4,351,082 | 4,359,302 |
| 4,313,106 | 4,337,314 | 4,351,217 | 4,359,686 |
| 4,316,475 | 4,339,143 | 4,351,529 | 4,360,785 |
| 4,317,033 | 4,340,264 | 4,352,294 | |

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| Arizona | Tempe: Science Library, Arizona State University | (602) 965-7607 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 571-2122 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4508 |
| Illinois | Chicago Public Library | (312) 269-2865 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214, Ext. 215 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 930-0850 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1321** |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 226 |
| South Carolina | Charleston: Medical University of South Carolina | (803) 792-2372 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 528-2957 |
| Texas | Dallas Public Library | (214) 748-9071 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

All of the above-listed libraries, except the Cleveland Public Library, offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF November 27, 1982**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-19-80 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 7-20-81 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 8-28-81 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 12-18-81 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 10-06-81 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 12-17-80 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 3-16-81 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 11-24-80 |
| RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors. | 2-02-81 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 11-26-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 12-15-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 2-26-81 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 3-02-81 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 2-13-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 11-17-80 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-09-80 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during November 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents** ..... Numbers 3,214,767 to 3,221,338, inclusive

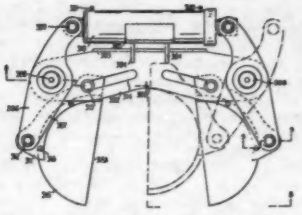
**Plant Patents** ..... Numbers 2,566 to 2,576 inclusive

# REEXAMINATIONS

## JANUARY 25, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

**B1 3,625,268 (45th)**
**FELLING HEAD RECIPROCATING BLADE TYPE**
**Carl Kempe, Ornskoldsvik, Sweden, assignor to Logging Development Corp., Montreal, Quebec, Canada.**
**Reexamination Request No. 90/000,031, Jul. 20, 1981.**
**Reexamination Certificate for Patent No. 3,625,268, issued Dec. 7, 1971, Ser. No. 9,391, Feb. 6, 1970.**
**U.S. Cl. 144/34 E** **Int. Cl.³ A01G 23/08.**

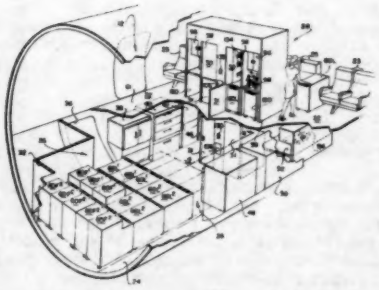


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–77 is confirmed.

---

**B1 3,517,899 (46th)**
**UNITIZED AIRCRAFT FOOD AND BEVERAGE SERVICE**
**Richard I. Vernon, Glendale, Calif., assignor to Lockheed Corporation, Burbank, Calif.**
**Reexamintion Request No. 90/000,144, Jan. 27, 1982.**
**Reexamination Certificate for Patent No. 3,517,899, issued Jun. 30, 1970, Ser. No. 718,691, Apr. 4, 1968.**
**U.S. Cl. 244/118.5** **Int. Cl.³ B64D 11/04.**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 12 are determined to be patentable as amended:

Claims 2–11, dependent on amended claims, are determined to be patentable.

**1.** In an aircraft having a fuselage containing an upper deck and a lower deck, the upper deck being adapted to carry passengers, the improvement which comprises:

a kitchen located on the lower deck *for the storage and preparation of beverage and individual servings of food items to be served to passengers on the upper deck,*

a service module located above said kitchen on the upper deck, said service module dividing said aircraft into separate passenger areas,

*a plurality of temperature controllable serving units normally carried in said kitchen, said serving units having wheels and being adapted to contain said items to be served to passengers in said aircraft,*

elevator means disposed within said service module [for] *and* connecting said kitchen and said service module *for providing a passage for aircraft passenger service personnel between decks during the course of a flight and for prepositioning individual serving units* [whereby items] from said kitchen [are prepositioned] within said service module *at passenger deck level* [by said elevator means],

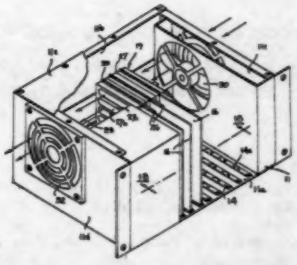
[a plurality of serving units normally carried in said kitchen, each of said serving units have wheels and being adapted to contain items to be served to passengers in said aircraft],

said serving units being capable of being transported from said kitchen to said service module through said elevator means and being adapted to be stored within said elevator means *at either deck level* and being further adapted to permit *said* items held by said serving units to be dispensed to the passengers within said aircraft when said serving unit is in situ within said service module and when circulated among passengers, *and*

*built-in cold storage means and built-in oven means located within said kitchen separate from said serving units for use by said personnel in the performance of food and beverage storage and preparation tasks.*

---

**B1 4,122,508 (47th)**
**MODULAR PRINTED CIRCUIT BOARD ASSEMBLY HAVING COOLING MEANS INCORPORATED THEREIN**
**Paul S. Rumbaugh, Garden Grove, Calif., assignor to Aitec Corporation, Anaheim, Calif.**
**Reexamination Request No. 90/000,049, Aug. 7, 1981.**
**Reexamination Certificate for Patent No. 4,122,508, issued Oct. 24, 1978, Ser. No. 831,066, Sep. 6, 1977.**
**U.S. Cl. 361/384** **Int. Cl.³ H05K 7/20.**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended:

Claims 2–7, dependent on amended claims, are determined to be patentable.

1. A modular printed circuit board assembly comprising:

a plurality of similar modular units, each of said units including a heat sink element having a main body portion in the form of a plurality of cooling fins between which openings are formed and a flange portion in the form of a plate which extends from the main body portion; and a printed circuit board attached to the flange portion to form an integral unit with the heat sink element,

a housing having a base and top cover for said modular units,

means for removably supporting said modular units in said housing in side by side relationship to form a stack with corresponding openings in said modular units aligned with each other in series to form a plurality of parallel unimpeded channels extending through said stack from one side to the opposite side thereof, *all of said channels being substantially parallel to each other,* and

means for circulating ambient air *from outside the housing* through said channels *and out from the housing in substantially unidirectional straight lines* comprising a blower mounted in a wall of said housing at one *open* end of *all of* said channels and a vent mounted in a wall of said housing opposite said first mentioned wall at the other *open* end *of all* of said channels, *each of said channels being directly aligned longitudinally in a substantially straight line path between said blower and said vent,* whereby air streams are flowed in substantially *unidirectional* straight lines from outside said housing across the fins and out from the housing through the vent.

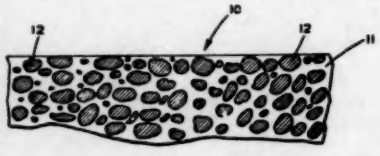
---

**B1 3,328,231 (48th)**

## METHOD OF PRODUCING CAST SURFACES AND PRODUCT OBTAINED THEREBY

**John A. Sergovic, Severna Park, Md., assignor to The Buras & Russell Company of Baltimore City, Baltimore, Md.**

**Reexamination Request No. 90/000,072, Sep. 18, 1981.**
**Reexamination Certificate for Patent No. 3,328,231, issued Jun. 27, 1967, Ser. No. 542,368, Apr. 13, 1966.**
**U.S. Cl. 428/451 Int. Cl.³ B32B 13/12; E04C 2/04.**




**AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:**

The patentability of claims 1-5 and 9 is confirmed.

Claim 11, having been finally determined to be unpatentable, is cancelled.

Claims 6, 10 and 13 are determined to be patentable as amended:

Claims 7, 8 and 12, dependent on amended claims, are determined to be patentable.

6. The method of providing *a masonry block with* a cast resin surface which is hard and abrasion resistant and resistant to staining over long periods of use, which *method* comprises polymerizing *on a masonry block* a resinous composition of an ethylenically unsaturated polymerizable resin and sand particles treated with a bonding agent comprising an alkylene substituted silane, *the silane used in an amount equal to from about 0.1 to 2% by weight of the sand particles,* said sand comprising at least 50% by weight of said composition, [and wherein] the sand particles [have] *having* a moisture content of from about 1/6 to about 3 times the weight of alkylene substituted silane employed as the bonding agent, *and essentially all the sand particles being from about one-sixteenth to two millimeters in diameter.*

10. The method of producing *on a masonry block* a cast resin surface which is hard and abrasion resistant and resistant to staining over long periods of use, which *method* comprises treating sand particles with an alkylene substituted silane bonding agent, *the silane used in an amount equal to from about 0.1 to 2% by weight of the sand particles and* said sand particles having a moisture content of from about 1/6 up to 3 times the weight of alkylene substituted silane bonding agent employed, heating the treated sand particles at a temperature of at least about 160° F., polymerizing *on a masonry block* a composition comprising the thus treated sand particles and an ethylenically unsaturated polymerizable resin, said sand particles comprising at least about 50% by weight of said composition *and essentially all the sand particles being from about one-sixteenth to two millimeters in diameter.*

13. A masonry block having an integral molded facing layer of a composition comprising the reaction product of an ethylenically unsaturated alkyd resin and a plymerizable vinyl monomer and sand as a filler, the latter being in an amount of at least about 50% and not over 90% of the total of the resin, monomer and filler by weight, the composition of said facing layer permeating the adjacent surface of said block, said composition being cured to permanently interlock said facing layer and block and to form a facing layer having a hard, abrasion resistant surface substantially free of pits and pinholes and possessing elasticity enabling the layer to be resistant to peeling, crazing, staining and cracking due to blows and to differences in coefficients of expansion and contraction between the said block and the said facing thereon, said sand particles and said reaction product being bonded to one another by a bonding agent comprising between about 0.1% and 2% by weight of sand of an alkylene substituted silane, *said silane being bonded to the sand using a moisture content on the sand of from about 1/6 up to 3 times the weight of the silane,* said ethylenically unsaturated alkyd resin and polymerizable vinyl monomer being present in an amount of from about 40 to 80 parts of the former for each 100 parts of combined weight of ethylenically unsaturated alkyd resin and polymerizable vinyl monomer *and essentially all the sand particles being from about one-sixteenth to two millimeters in diameter.*

# REISSUES

## JANUARY 25, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 31,130**

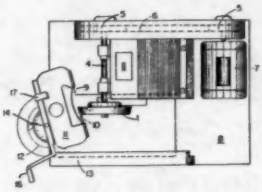
### WOOD TURNING PROCESS AND APPARATUS FOR MAKING CYLINDROCONICAL WOOD PRODUCTS

**Robert W. Bebout, Spring Hill, Fla., assignor to John Totten, Orlando, Fla.**

**Original No. 4,082,126, dated Apr. 4, 1978, Ser. No. 788,270, Apr. 18, 1977. Application for reissue Mar. 28, 1980, Ser. No. 135,379**

**Int. Cl.³ B23B** *1/00, 5/26*

**U.S. Cl. 142—1** **13 Claims**



*7. Apparatus for turning cylindroconical rings from wood blanks comprising:*

*frame means;*

*wood blank holding means mounted on said frame means, said holding means rotatable at a selected speed of rotation;*

*table means mounted on said frame means and adapted to be slidably movable with respect to said frame means in a direction parallel to a wood blank held by said wood blank holding means;*

*a pair of wood cutting bits;*

*bit holding means for holding said pair of wood cutting bits in a horizontally opposed position with the cutting edges of said bits spaced by distance greater than the thickness of the wood blank to be turned;*

*adjustment means attached to said table means for supporting said bit holding means, said adjustment means adapted to adjust the angle of said bits with respect to the plane of the wood blank to be turned;*

*bit moving means for selectably moving each of said cutting bits horizontally and so as to cause said cutting edges to engage a face of the wood blank to be turned;*

*drive means for rotating said wood blank holding means; and at least one movable template attachable to said frame means and having a series of spaced locking notches to permit accurate positioning of said table means during each turning operation.*

*13. The method of turning cylindroconical rings from wood blanks for use as components of cylindroconical wood products comprising the steps of:*

*a. attaching a wood blank to a rotatable shaft;*

*b. rotating the shaft at a selected cutting speed;*

*c. disposing a pair of horizontally opposed wood cutting bits having the tooth ends spaced greater than the thickness of the wood blank and with the wood blank between but not in contact with the pair of bits;*

*d. adjusting the angle between the plane of the pair of bits and the plane of the wood blank to a desired cylindroconical angle;*

*e. adjusting the positions of the pair of bits relative to the axis of the rotatable shaft to cut the outer cylindroconical surface of the first ring;*

*f. moving the pair of bits in a first direction to cause one of the bits to cut into one face of the wood blank to a depth approximately equal to one half the thickness of the blank;*

*g. moving the pair of bits in a second direction to cause the other of the bits to cut into the opposite face of the wood blank to a depth sufficient to connect with the cut made in step f above;*

*h. moving the pair of bits to the position defined in step c above;*

*i. adjusting the position of the pair of bits relative to the axis of the rotatable shaft to cut the inner cylindroconcial surface of the first ring simultaneously with the outer cylindroconical surface of a second ring; and*

*j. repeating steps f through i until a desired number of cylindroconical rings has been produced.*

---

**Re. 31,131**

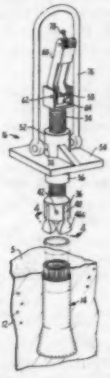
### CONCRETE SLAB HOISTING APPARATUS

**Philip A. Torbet, Port Washington, N.Y., and Thomas Eager, San Anselmo, Calif., assignors to The Burke Company, San Mateo, Calif.**

**Original No. 4,068,879, dated Jan. 17, 1978, Ser. No. 704,368, Jul. 12, 1976. Application for reissue Aug. 21, 1978, Ser. No. 935,513**

**Int. Cl.³ B66C** *1/66*

**U.S. Cl. 294—89** **11 Claims**



*11. Apparatus for the releasable connection to a tubular member embedded in an object, the member defining an opening in the object and including an inwardly facing shoulder disposed interiorly of the opening, the apparatus comprising: plate means adapted to be placed across the opening and including an aperture for alignment with the opening; an elongate housing extending through the aperture and having an axial bore, the inner end of the housing being adapted for positioning in said opening, and including a laterally extending cutout, a locking lug carried by the housing for lateral movement within the cutout from a first position in which the lug is out of engagement with the shoulder to a second position in which a portion of the lug protrudes laterally from the housing into engagement with the shoulder; and actuating means slidably disposed in the bore for moving the lug between the first and second positions responsive to movement of the actuating means longitudinally in the bore between corresponding first and second positions; the actuating means including means for positively and mechanically locking the lug in its second position when the actuating means is in its second position.*

**Re. 31,132**

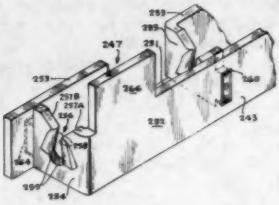
## ELECTRICAL CONNECTOR AND INSULATION-PIERCING CONTACT MEMBER

**Paul P. Hoppe, Jr., Arlington Heights, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Original No. 3,926,498, dated Dec. 16, 1975, Ser. No. 288,998, Sep. 14, 1972. Application for reissue Feb. 16, 1977, Ser. No. 769,106**

**Int. Cl.³ H01R** *9/00, 13/58*

**U.S. Cl. 339—97 R** **41 Claims**



**1.** A unitary contact member formed from a single piece of thin, conductive sheet metal, comprising:

an active contact element;

and an integral terminal element, comprising side and bottom walls forming an elongated channel of U-shaped cross-sectional configuration with inner and outer end portions,

said terminal element including at least one terminal flange, formed by at least one flange element struck from one of said walls of said channel and bent to extend transversely of said channel, said flange extending completely across said channel and interlocked with at least one other wall of said channel,

said flange having an upwardly open notch for receiving an insulation-covered electrical conductor, the upper portion of said notch converging downwardly and having thin edges to afford a cutting section for shearing through the insulation on the conductor,

the medial portion of said notch having gradually thickened edges constituting a transition section for spreading the insulation on the conductor,

and the lower portion of said notch having smooth, curved thickened edges affording a terminal section with a resilient pressure jaw engaging the electrical conductor in wiping contact.

---

**Re. 31,133**

## EXTRUSION METHODS

**Rudolf Niessner, Bogen, and Max Sonnleitner, Oberaltaich, near Bogen, both of Fed. Rep. of Germany, assignors to Thyssen Plastik Anger KG, Munich, Fed. Rep. of Germany**

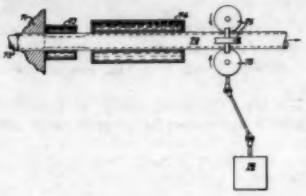
**Original No. 3,264,383, dated Aug. 2, 1966, Ser. No. 176,179, Feb. 23, 1962. Division of Ser. No. 176,179, Feb. 23, 1962, Pat. No. 3,205,535. Application for reissue Jun. 1, 1976, Ser. No. 691,828**

**Claims priority, application Fed. Rep. of Germany, Feb. 25, 1961, K 43,015**

**Int. Cl.³ B29F** *3/02;* **B29C** *17/07*

**U.S. Cl. 264—541** **11 Claims**

**1.** A process for the production of plastic tubes which have at least at one end thereof an increased wall thickness for a predetermined length, said process comprising continuously advancing plastic material through an extruder to produce a continuous extruded cylinder, cooling the extruded cylinder as it is discharged from the extruder whereby the plastic material is hardened thereat, engaging the thus cooled cylinder to draw the same through the extruder and past the region where the cylinder is cooled, periodically increasing the ratio of the speed at which the material is fed to the extruder relative to the speed at which the cylinder is drawn from the extruder *by periodically decreasing the speed at which the cylinder is drawn*



*from the extruder* to upset the tube where it is discharged from the extruder to form periodic increases in thickness in the cylinder *at selected areas* and dividing the cylinder thus formed with the periodic increases in thickness to produce tubes which have increased wall thickness at least at one end thereof.

---

**Re. 31,134**

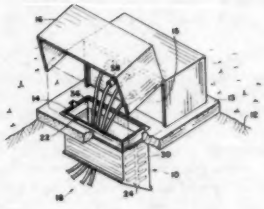
## GROUND LEVEL TRANSFORMER UNIT

**Robert J. Lux, Jr., Broken Arrow, Okla., assignor to Thermodynamics Corporation, Broken Arrow, Okla.**

**Original No. 4,213,111, dated Jul. 15, 1980, Ser. No. 937,517, Aug. 28, 1978. Application for reissue Dec. 22, 1980, Ser. No. 218,659**

**Int. Cl.³ H01F** *15/02*

**U.S. Cl. 336—65** **5 Claims**



*5. A ground level transformer unit for connecting to underground cables, comprising:*

*a horizontal pad having an upper and a lower surface, the lower surface being adapted to rest upon the earth and the upper surface adapted to receive a transformer thereon, the pad having a vertical opening providing means to receive underground cables therethrough;*

*a transformer positioned on said pad having means for connection to underground cable extending through said cable opening; and*

*a cable vault of vertical, hollow, open-top and open-bottom construction, and of cross-sectional dimensions, in a plane parallel to said upper and lower surfaces, greater than said pad cable opening and less than said pad, the vault adapted for burial beneath the earth's surface and to receive underground cables therethrough while providing space to accept slack in the cables, the cable vault having an open top portion configured to communicate with said pad cable opening, the cable vault top portion being in contiguous relationship with said pad lower surface, providing a passageway for slacked underground cables to connect to said transformer.*

# PLANT PATENTS

## GRANTED JANUARY 25, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

### 4,977
### PLUM TREE

William E. Hengst, Exeter, Calif., assignor to Alan D. Ewen, Sacramento, Calif.

Filed Oct. 26, 1981, Ser. No. 314,924
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree as described, illustrated and identified by the characteristics enumerated above.

### 4,978
### CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 5, 1980, Ser. No. 175,754
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., plant known by the cultivar name Klondike, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; dark yellow ray floret color; diameter across face of capitulum ranging from 95 to 110 mm. at maturity; uniform nine week flowering response; tall plant height; and semi-spreading branching pattern.

# PATENTS

## GRANTED JAN. 25, 1983

### ERRATA

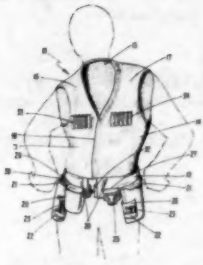
| For CLASS | See PATENT NO. |
|---|---|
| 604–390 | 4,369,786 |
| 604–096 | 4,369,789 |
| 604–280 | 4,369,790 |
| 494–008 | 4,369,915 |
| 384–154 | 4,370,005 |
| 436–120 | 4,370,146 |
| 420–582 | 4,370,163 |
| 420–503 | 4,370,164 |
| 378–120 | 4,370,555 |

# PATENTS

## GRANTED JANUARY 25, 1983

## GENERAL AND MECHANICAL

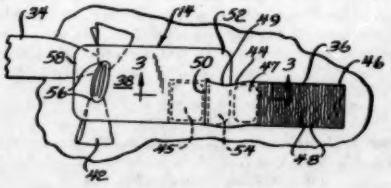
**4,369,526**
**UTILITY VEST**
**Earnest H. Clutts, 3906 Venus Cir., Huntsville, Ala. 35810**
**Filed Oct. 8, 1980, Ser. No. 194,927**
**Int. Cl.³ A41D *13/04***
**U.S. Cl. 2—51** **6 Claims**



1. A utility vest comprising
a sleeveless vest made of a lightweight, strong material having an integral body comprising a back panel, two side panels, two front panels and a shoulder panel connecting each front panel to the back panel;
front panel closing means connected to the front panels for closing and opening the front panels of the vest;
a utility apron made of a cloth material;
utility apron connecting means located beneath the front panel closing means and attached to and around the lower periphery of the vest panels and to the top of the utility apron for detachably connecting the utility apron to and around the lower periphery of the vest panels;
a plurality of pouches adapted to hold tools and supplies of various kinds;
pouch connecting means attached to the utility apron at desired locations and to the top of each pouch for detachably and interchangeably connecting each pouch to the utility apron at the desired locations; and
buckle means located beneath the utility apron connecting means and attached to each end of the utility apron for detachably securing the ends of the utility apron.

---

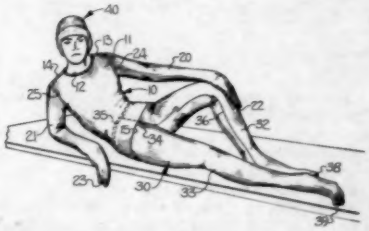
**4,369,527**
**DISPOSABLE GARMENT WITH CARD LOOP**
**Amy S. Paul, Wayland, Mass., assignor to The Kendall Company, Boston, Mass.**
**Filed Apr. 22, 1982, Ser. No. 370,875**
**Int. Cl.³ A41B *13/10***
**U.S. Cl. 2—51** **8 Claims**




1. A disposable garment, comprising:
a gown having a pair of sleeves, a front, and a pair of side margins defining an open back for the gown;
a first belt having one end secured to the gown and the other end being free;
a second belt having one end secured to the gown at spaced locations defining a loop between said locations; and
a transfer card having a slit, and means for releasably attaching the other end of the first belt to the card, with the card slit being received on the second belt loop to hold the card in place on the gown.

---

**4,369,528**
**GARMENT FOR MAINTAINING BODY TEMPERATURE AND METHOD OF MAKING SAME**
**H. Ryland Vest, Raleigh, and Walter S. Boone, Valdese, both of N.C., assignors to Alba-Waldensian, Inc., Valdese, N.C.**
**Filed Feb. 23, 1981, Ser. No. 236,667**
**Int. Cl.³ A41D *13/00***
**U.S. Cl. 2—69** **14 Claims**




8. A garment for maintaining the body temperature of a patient, particularly during the time the patient is undergoing surgery in an operating room where the ambient temperature is usually maintained below the normal body temperature, said garment being constructed of cut segments of stretchable circular knit seamless fabric so that said garment has sufficient stretchability to fit a wide range of body sizes, said garment including an upper body portion comprising an upper trunk covering portion including an upper neck opening and having a free open lower end, said trunk covering portion being of a sufficient length to cover and extend below the waist of the wearer, a pair of sleeve openings, seams extending from opposite sides of said neck opening and to said sleeve openings, and a pair of sleeves having upper ends seamed to said sleeve openings of said trunk covering portion and having free open lower ends, said sleeves being of a sufficient length to cover and extend beyond the hands of the wearer, said upper trunk covering portion and said sleeves comprising cut fabric segments including opposing ends, one end of which will ravel and the other end of which will not ravel, said cut fabric segments being oriented so that said free open lower ends of said upper trunk covering portion and said sleeves are formed of the nonraveling raw cut ends of said cut segments.

14. A method of forming a garment for maintaining the body temperature of a patient, particularly during the time the patient is undergoing surgery in an operating room where the ambient temperature is usually maintained below the normal body temperature, said garment including an upper body portion comprising an upper trunk covering portion of sufficient length to cover and extend below the waist and having a free open lower end, and a pair of sleeves having upper ends seamed to said upper trunk covering portion and being of sufficient length to cover and extend beyond the hands of the wearer with free open lower ends, said method comprising the steps of transversely cutting a first stretchable circular knit seamless fabric to form a cut body segment of a sufficient

length to form said upper trunk covering portion, transversely cutting a second stretchable circular knit seamless fabric to form a pair of cut sleeve segments of a sufficient length to form said sleeves, said cut body segment and said cut sleeve segments each including one raw end which will ravel and an opposing nonraveling raw end, orienting said cut body segment so that said nonraveling end forms said free open lower end of said trunk covering portion, orienting said cut sleeve segments so that said nonraveling ends form said free open lower ends of said sleeves, and seaming said raveling ends of said cut sleeve segments to said cut body segment adjacent said raveling end thereof.

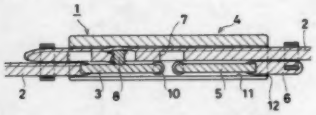
---

**4,369,529**

## BELT WITH BUCKLE

**Eiji Yahata, 1506-4, Oaza-chizu, Chizucho, Yazugun, Tottori, Japan**

**Filed Dec. 1, 1980, Ser. No. 211,570**
**Int. Cl.³ A41F *3/00***
**U.S. Cl. 2—322** **4 Claims**




1. A belt with a buckle, which comprises a belt having a plurality of holes provided at proper intervals on its back side at its free end, each of said holes having an opening only on the back side of said belt, a base having a projection provided on its upper surface, to the left-hand end of which the other end of said belt is secured, a cover having a pair of sides bent downward, said cover being rotatably mounted on said base in such a manner that the head of said projection may abut against the back side of said cover and that the junction of said belt and said base may be positioned at the left-hand end on the backside of said cover, and an adjusting belt having the same thickness as that of said belt, said adjusting belt being rotatably attached to said sides of said cover opposite to said base.

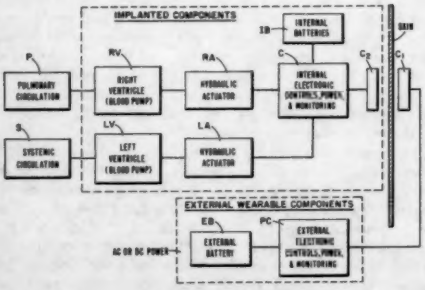
---

**4,369,530**

## HYDRAULICALLY ACTUATED CARDIAC PROSTHESIS AND METHOD OF ACTUATION

**Thomas C. Robinson, and Sotiris Kitrilakis, both of Berkeley, Calif., assignors to Foxcroft Associates, San Antonio, Tex.**

**Filed May 19, 1981, Ser. No. 265,100**
**Int. Cl.³ A61F *1/24*; A61M *1/03***
**U.S. Cl. 3—1.7** **56 Claims**




1. An implantable hydraulic actuation system for supplying motive power to a blood pumping chamber having a flexible portion comprising:

an actuation fluid reservoir;

actuation fluid pumping means in fluid communication with said reservoir for providing intermittent pulses of actuation fluid;

an actuation chamber having an actuation fluid inlet path in fluid communication with said pumping means, and a separate actuation fluid outlet path in fluid communication with said reservoir; said actuation chamber being adapted to cause displacement of the flexible portion of said blood pumping chamber in response to changes in volume of actuation fluid in said actuation chamber; and

valve means associated with said actuation chamber adapted to close or open said actuation fluid outlet path primarily in response to forces which vary as a function of actuation fluid flow through said actuation fluid inlet path.

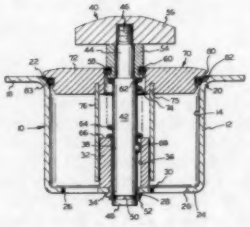
---

**4,369,531**

## LIQUID FLOW CONTROL STRAINER

**Richard G. Swanson, West Hartford, Conn., assignor to Maristy Industries, Inc., New Britain, Conn.**

**Filed May 4, 1981, Ser. No. 260,085**
**Int. Cl.³ A47K *1/14***
**U.S. Cl. 4—295** **16 Claims**



1. A strainer for controlling liquid flow through the drain of a tub or similar vessel, comprising: a body defining an axial passageway and having a seat portion providing a sealing surface adjacent the inlet end thereof; a plunger having a stem extending into said passageway and mounted on said body for axial reciprocation between an extended outward position and a depressed inward position; means for biasing said plunger to said outward position; stopper means slideably mounted on said plunger stem and having a stopper aligned over said seat portion of said body for seating thereon to close said strainer, said stopper having an outer peripheral edge portion adapted to sealingly engage said sealing surface of said body when said stopper is in said seated position, said stopper means having an axial bore with a surface portion dimensioned and configured to conform to the corresponding portion of said plunger stem; and a resiliently deformable sealing ring fixedly mounted on and extending about said plunger stem portion at a position spaced inwardly from the outer end of said stem; whereby said strainer may be opened from its closed condition by depressing and then releasing said plunger, inward movement of said plunger causing said sealing ring to be displaced to a position of binding engagement on said bore surface portion, and subsequent outward movement under the force of said biasing means causing said plunger to lift said stopper means and to displace said stopper from said seat portion of said body.

---

**4,369,532**

## SINK ASSEMBLY

**Stanley L. Houchins, Rte. #2, Box 302, and Thomas B. Jackson, Rte. #2, Box 3A, both of Max Meadows, Va. 24360**

**Filed Nov. 26, 1980, Ser. No. 210,718**
**Int. Cl.³ A47K *1/04***
**U.S. Cl. 4—619** **13 Claims**

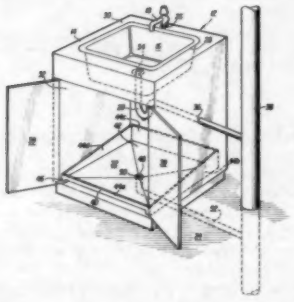
1. A sink assembly for use in a house comprising:

a cabinet for supporting a sink from a floor, said cabinet

having an upper surface with a sink opening therein and including enclosing cabinet walls and a lower-most floor below said opening for defining an enclosed space below said sink opening, said cabinet walls including a cabinet door on a front side thereof for allowing access into said enclosed space below said sink opening;

a sink bowl supported by the upper surface of said cabinet, said sink bowl extending into said sink opening, said sink bowl having a drain opening located in said enclosed space;

a water-supply means located above said upper surface for supplying water into said sink bowl;



a first drain pipe connected to said sink bowl at said drain opening for exhausting water from said sink outside of said house;

a separate liquid-impervious cabinet liner supported by the lower-most floor of said cabinet within said enclosed space below said sink bowl for catching water dripping from said sink bowl and said first drain pipe, said separate liquid-impervious cabinet liner having a liner floor means adjacent said cabinet floor for forming a drain pan supported to be above the lowermost floor of the cabinet for receiving goods to be stored thereon.

---

**4,369,533**

**BED FOR SICK PERSON**

**Hermann Gisiger, Nischenweg 3, CH-3013 Bern, Switzerland**

**PCT No. PCT/CH80/00042, § 371 Date Nov. 25, 1980, § 102(e) Date Nov. 25, 1980, PCT Pub. No. WO80/02109, PCT Pub. Date Oct. 16, 1980**

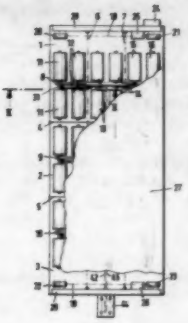
**PCT Filed Apr. 3, 1980, Ser. No. 224,558**

**Claims priority, application Switzerland, Apr. 3, 1979, 3063/79**

**Int. Cl.³ A61G *7/00***

**U.S. Cl. 5—61** **12 Claims**

1. Bed for sick and disabled persons comprising a plurality of juxtaposed rollers, and endless belt (17) surrounding said plurality of rollers and being movable to and fro in the transverse direction of the bed and a mattress (27) mounted on said endless belt (17), said plurality of rollers including first rollers (11,16), arranged along the longitudinal borders of the bed and second rollers (12,15) arranged between said first rollers (11,16) and the center line of the bed, at least one of said second rollers (12,15) being liftable on both sides of the bed to such a height that the sick person can be turned from the supine position into one side position and said first rollers (11,16) being shiftable in such a way that they (11,16) are shifted perforce, during the lifting and lowering of such second rollers



(12, 15), in the direction toward the center line of the bed and back toward the outside.

---

**4,369,534**

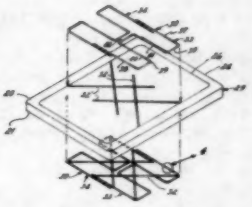
**CENTER REINFORCED MATTRESS**

**Ronald E. Wright, P.O. Box 245, Jasper, Mo. 64755**

**Filed Oct. 20, 1980, Ser. No. 199,052**

**Int. Cl.³ A47C *23/04, 23/05***

**U.S. Cl. 5—475** **3 Claims**



1. An improved mattress comprising,

a coil spring matrix including a plurality of coil springs arranged in a matrix configuration having a plurality of transverse coil spring rows and a plurality of longitudinal coil spring columns, said transverse rows and longitudinal columns of coil springs having end loops interconnected by helical lacing wires, said end loops being located in and defining the top and bottom surfaces of said spring matrix,

two grid assemblies sized to overlie a central one-third surface area of said coil spring matrix, one of said grid assemblies being located on the top surface of said mattress, and the other of said grid assemblies being located on the bottom surface of said mattress, each of said grid assemblies comprising,

a pair of grid elements, each of said grid elements comprising a wire having a pair of opposed legs interconnected by a web section, the opposed legs of one grid element partially overlapping the opposed legs of the other grid element, said web section of each of said grid elements having a generally U-shaped offset formed therein, said offset having a pair of leg sections interconnected by a web section such that each of said grid elements is generally M-shaped in configuration, said legs of said grid elements extending parallel to said transverse rows of coil springs, and

diagonally extending non-metallic straps located between the top surface of said coil spring matrix and said grid elements, said straps extending diagonally relative to said transverse rows and longitudinal columns of coil springs

and being connected at their ends to said grid elements, and

connector means connecting each of said grid elements to said end loops of said coil springs of said coil spring matrix.

---

4,369,535

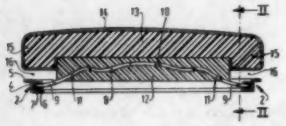
## MATTRESS ASSEMBLY

Pierre J. Ekkerink, Maastricht, Netherlands, assignor to Vredestein N.V., Velp, Netherlands

Filed Dec. 19, 1980, Ser. No. 218,034

Int. Cl.³ A47C *27/15, 27/16*

U.S. Cl. 5—481 13 Claims



1. A mattress assembly comprising an elongated framework, a plurality of parallel laths fastened therein in the direction of width and a mattress consisting at least partly of foam material, characterized in that the central parts of the laths are located in the and surrounded by the foam material and in that the two end parts emerge from the mattress.

---

4,369,536

## APPARATUS FOR USE IN HEAT SETTING A LASTED SHOE UPPER

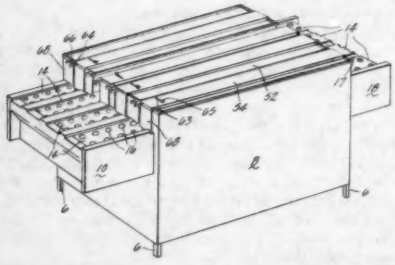
Raymond Hanson, Rearsby, and Anthony M. White, Oadby, both of England, assignors to USM Corporation, Farmington, Conn.

Filed Dec. 8, 1980, Ser. No. 214,232

Claims priority, application United Kingdom, Feb. 19, 1980, 8005558

Int. Cl.³ A43D *11/00*

U.S. Cl. 12—1 A 8 Claims



1. A machine for use in heat setting a lasted shoe upper, said machine comprising:

a plurality of substantially enclosed channels having air inlets arranged along both sides thereof;

conveying means operable to convey lasted shoe uppers longitudinally along the channels;

air blowing means and air moistening means operable to blow moistenable air through the inlets into the channels so that a lasted shoe upper passing through a channel is subjected to air blown thereonto from both sides of the channel; and

heating means operable to heat the air blown by the air blowing means to an elevated temperature.

4,369,537

## METHOD OF FORMING A FOOTWEAR COMPONENT

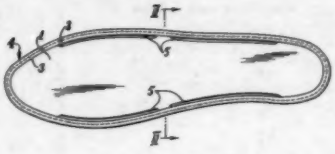
Noel H. Midgley, 361 Dandenong Rd., Armadale, Victoria 3143, Australia

Filed May 12, 1980, Ser. No. 149,289

Claims priority, application Australia, May 9, 1979, PD8727; Dec. 19, 1979, PE1777

Int. Cl.³ A43D *9/00;* A43B *13/39, 3/12, 13/08*

U.S. Cl. 12—142 RS 11 Claims



1. A method of forming a footwear component comprising simultaneously forming by cutting from a single piece of sheet material a rand and an innersole, said rand extending at least part-way around said innersole, said rand and innersole being substantially co-planar whereby said rand forms a substantially planar lateral extension of said innersole, wherein the boundary between said rand and said innersole is formed by a score line extending at least part-way through the material whereby said rand may be integral with, separate or separable from said innersole in the components so formed, and wherein said boundary between said rand and said innersole formed by said score line comprises a series of partial bridges and perforations wherein the bridges are formed by cutting part-way through the material along said boundary whereby said innersole is separable from said rand.

---

4,369,538

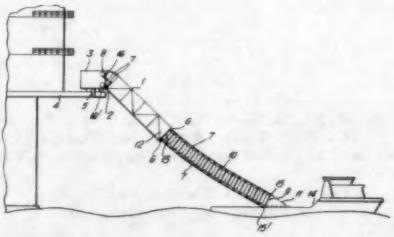
## APPARATUS FOR TRANSFER OF PERSONS AND GOODS BETWEEN STRUCTURES OFFSHORE

Arne Smedal, Torjusholmen, 4818 Pusnes, Norway

Filed Mar. 3, 1980, Ser. No. 126,575

Int. Cl.³ E01D *1/00*

U.S. Cl. 14—69.5 5 Claims



1. Apparatus for offshore transfer of persons and goods, preferably between a supply vessel and a fixed platform or a moored drilling/production platform or vessel, comprising a rigid gangway of which one end is pivotably suspended on a vertical and a horizontal axis arranged on a vessel, the second end of the rigid gangway having a transition to one end of a longitudinally extensible and retractable bellowshaped gangway where changes of the total length is approximately equalized between the various bellows elements, the second end of the bellowshaped gangway being attachable to a vessel, and the bellowshaped gangway when it is in use being supported by at least one elongated flexible supporting member maintained in tension within predetermined limits, said member

being fixed at one end and having an opposite end connected to a tension adjusting winch controlled by signals from a sensor which is responsive to the tension in said member.

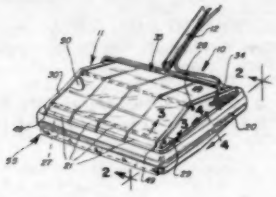
---

**4,369,539**

## POWERED FLOOR SWEEPER

**Erwin E. Nordeen, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Jan. 7, 1981, Ser. No. 223,099**
**Int. Cl.³ A47L *11/18***
**U.S. Cl. 15—49 C** **17 Claims**



1. In a floor sweeping appliance having a rotatable sweeper brush, the improvement comprising:

a wheeled housing for housing the brush, said housing comprising a plurality of similar generally tubular, hollow wall segments having internal wall portions cooperatively defining separated brush mounting and dirt-collecting spaces, and tie rod means extending fully through the segments lengthwise thereof for retaining the segments in assembled side-by-side relationship.

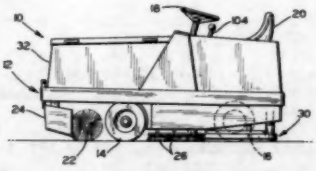
---

**4,369,540**

## FLOOR CLEANING MACHINE

**Jack L. Burgoon, and David J. Karpanty, both of Toledo, Ohio, assignors to The Scott & Fetzer Company, Lakewood, Ohio**

**Filed Mar. 27, 1981, Ser. No. 248,298**
**Int. Cl.³ A47L *11/24, 11/30***
**U.S. Cl. 15—49 R** **26 Claims**



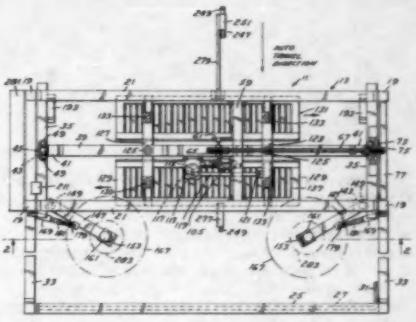
1. A floor cleaning machine comprising a frame, a rotary broom having a shaft, a first arm having an end portion rotatably carrying a first end of said shaft, a second arm having an end portion rotatably carrying a second end of said shaft, a drive motor carried by said second arm and connected to said shaft near said second end to turn said shaft and said broom, a hopper removably mounted on said arms, a lift shaft having end portions affixed to the other end portions of said arms, means rotatably supporting said lift shaft from said frame, and means for turning said lift shaft to rotate said arms and to raise and lower said broom and said hopper.

**4,369,541**

## RETRACTABLE WAX, BUFF AND POLISH APPARATUS FOR CARS

**James A. Belanger, Northville; Robert J. Wentworth, Ann Arbor; Douglas J. Calvin, Livonia, and Graham J. Astley, Novi, all of Mich., assignors to Belanger, Inc., Northville, Mich.**

**Filed Apr. 6, 1981, Ser. No. 251,596**
**Int. Cl.³ B60S *3/04***
**U.S. Cl. 15—97 B** **26 Claims**



1. A retractable wax, buff and polish apparatus for a car comprising an upright open framework upon a floor through which a car is adapted to pass;

said framework including a pair of spaced upright side supports at its ends and top cross beams spanning said supports;

upright guide means upon said side supports;

a transverse carriage extending between said side supports at its ends movably mounted upon said guide means for vertical adjustments thereon;

an upright mount plate secured to said carriage intermediate its ends;

a counterweight guidably positioned within one pair of said side supports;

a sprocket chain including spaced idler sprockets journalled upon said framework, said chain at one end secured to said counterweight and at its other end secured to said mount plate;

a pair of laterally spaced horizontal mount arms pivotally mounted intermediate their ends upon said carriage transversely thereof;

a pair of horizontal parallel spaced coplanar curtain racks below said carriage centrally thereof;

support rods on and depending from end portions of said mount arms respectively and pivotally connected to said racks centrally thereof adjacent their opposite ends respectively;

a plurality of elongated parallel spaced flexible fabric panels at their upper ends secured to and depending from said racks;

rotative power means on said mount plate eccentrically connected to one of said mount arms for transversely oscillating said racks relative to said carriage;

said panels defining a segmented curtain adapted on lowering of said carriage for buffing and polishing engagement with the car;

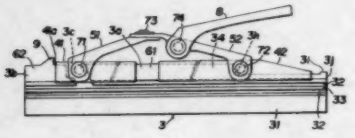
and reciprocal power means upon said framework below said counterweight and connected thereto for selectively raising and lowering said counterweight repsectively for correspondingly lowering and raising said curtain.

4,369,542

## MIRROR APPARATUS HAVING WIPER MEANS

Takeo Tamura; Takayoshi Kido, both of Yokohama, and Tatsuo Nakamura, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Ichikoh Industries Limited, Tokyo, both of, Japan

Filed Aug. 10, 1981, Ser. No. 291,504
Claims priority, application Japan, Jan. 11, 1980, 55-1087[U]; Aug. 14, 1980, 55-114448[U]
Int. Cl.³ B60S 1/38
U.S. Cl. 15—250 B 4 Claims



1. A mirror apparatus having a wiper means intended to wipe a surface of a mirror supported on a mirror holder, wherein said wiper means comprises:

a rubber ribbon for wiping the mirror surface;

a pair of holders for supporting said rubber ribbon; and

a pair of stays for supporting said pair of holders, respectively, to cause them to exert wiping operations,

said rubber ribbon being provided with a curvable intermediate portion and a curvable end portion which are respectively resulted from arrangement of said rubber ribbon being supported by said pair of holders excluding an intermediate portion and at least one end portion of said rubber ribbon,

said pair of stays being coupled to each other by a shaft member at a site just above said intermediate portion of said rubber ribbon to provide for pivotable actions of these stays,

that particular holder which is located on said curvable end portion side of said rubber ribbon being coupled to its mating stay at a site located within a groove formed at a corresponding site of said rubber ribbon.

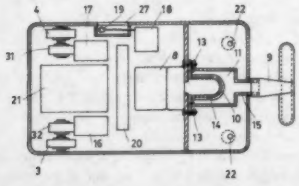
---

4,369,543

## REMOTE-CONTROL RADIO VACUUM CLEANER

Jen Chen, and Hong Chen, both of 36, La. 290, Kuan-Fu South Rd., Taipei, Taiwan

Filed Apr. 13, 1981, Ser. No. 253,496
Claims priority, application Taiwan, Apr. 14, 1980, 6921719
Int. Cl.³ A47L 9/00
U.S. Cl. 15—319 8 Claims



1. A remote-control radio vacuum cleaning system comprising:

(a) remote radio signal transmitting means capable of generating a carrier matched with multivibrator generated frequencies as control signals, and having plural push-button control means for controlling transmission and generation of said carrier matched frequencies; and

(b) vacuum cleaning means comprising, a vacuum cleaning device having drive means comprising a pair of d.c. motor sets for propulsing said vacuum cleaning device, rechargeable d.c. power supply means for supplying power to said pair of d.c. motor sets, electronic control means comprising four sets of relay channels, one of said four sets of relay channels controlling on and off operation of said vacuum cleaning device, and the others of the said four sets of relay channels associated with said drive means for controlling propulsive movement of said vacuum cleaning device, and radio signal receiving means associated with said four sets of relay channels for receiving and demodulating control signals of the multivibrator frequencies from said remote radio signal transmitting means for controlling the closing and opening of respective ones of said four sets of relay channels, whereby cleaning operation can be performed under control of said remote radio signal transmitting means.

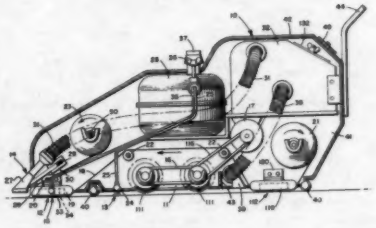
---

4,369,544

## MACHINE TO WASH SURFACES

Sebastiano Parisi, Rome, Italy, assignor to Novum in Elettrodomestica Srl, Trieste, Italy

Filed Jan. 2, 1981, Ser. No. 222,260
Claims priority, application Italy, Jan. 14, 1980, 83305 A/80
Int. Cl.³ A47L 11/282, 11/29, 11/30
U.S. Cl. 15—320 14 Claims



1. A machine to wash surfaces to be walked on having a front and back which comprises suction means in the front directed toward the surface to pick up loose materials from the surface,

absorbing means positioned behind said suction means contactable with said surface to wipe up material loosened from the surface, humidifier means cooperating with said absorbing means to loosen material from the surface,

sprayer means positioned behind said absorbing means directed toward said surface to moisten and loosen material from the surface, and

brush means positioned behind said sprayer means and contactable with said surface to loosen material from the surface.

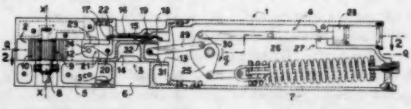
---

4,369,545

## DOUBLE ACTION DOOR CLOSURE MECHANISM

Georges Maublanc, St. Germain du Plain, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Nov. 10, 1980, Ser. No. 205,496
Claims priority, application France, Nov. 15, 1979, 79 28192
Int. Cl.³ E05F 3/00
U.S. Cl. 16—64 9 Claims



1. In a double-action door-closure mechanism including a spindle whose rotation is linked to the opening movement of a door and to a door restoration assembly which includes a

rotatable lever means coupled to a return spring and to a shock absorber, the improvement comprising:

a rack and pinion assembly comprising a pinion formed on the spindle, and two oppositely facing parallel racks permanently meshing with said pinion so that the racks slide in opposite directions for opposite opening directions, respectively, of the door; and

selective linkage means, coupled to said rotatable lever means, for selectively engaging only a different one of said racks with said rotatable lever means during movement of the door in the opposite directions, respectively, and for disengaging the same at the end of a door-closing movement, so that only one rack engages said rotatable lever means for each opening and closing movement, and so that neither rack engages said lever means in the closed position of the door.

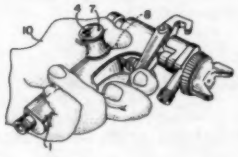
---

**4,369,546**

## HAND HELD TOOLS AND UTENSILS STABILIZER BAR, ADJUSTABLE AND NON-ADJUSTABLE

**Stanley V. Zientara, 5243 S. Normandy Ave., Chicago, Ill. 60638**

**Filed Dec. 28, 1979, Ser. No. 108,271**
**Int. Cl.³ A47B *95/02***
**U.S. Cl. 16—110 R** **15 Claims**



1. In a handle for a hand tool, to be grasped by one hand of a user, the improvement comprising:

a stabilizer bar secured to said handle and extending laterally from a side wall thereof for engagement by the thumb of the hand of the user, said stabilizing bar having a base portion adjacent the handle, a body portion having a length substantially equal to the width of the user's thumb at the knuckle thereof to receive and mate with the user's thumb to provide a stable grip for the tool, and an end surface remote from the handle.

---

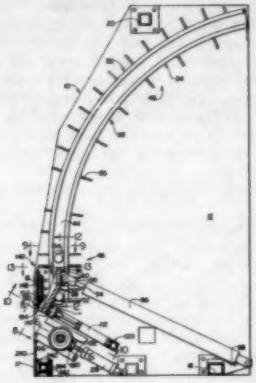
**4,369,547**

## ANIMAL SKINNING MACHINE

**Donald E. Robertson, P.O. Box 341; Randall E. Robertson, 8700 Sarah La.; Durrin D. Robertson, and Brooks A. Robertson, both of P.O. Box 341, all of Liberty, Mo. 64068**

**Filed Aug. 12, 1981, Ser. No. 292,255**
**Int. Cl.³ A22B *5/16***
**U.S. Cl. 17—21** **4 Claims**

1. An animal skinning machine which comprises upper and lower base frame members, means for supporting the base frame members in spaced relation, upper and lower clamp guide trackways mounted on the upper and lower base frame members, clamp carriages mounted on the clamp guide trackways for moving therealong between entry ends and output ends of the clamp guide trackways, a clamp body carried by the clamp carriages, first clamp means mounted on the clamp body, a clamp frame carried by the clamp body, clamp actuator means carried by the clamp frame, a second clamp means carried by the clamp actuator means and movable by the clamp actuator means between a released position spaced from the first clamp means and an engaged position for cooperating with the first clamp means for engaging a leading edge portion of an animal skin, an elongated knife member mounted between the base frame members adjacent the entry ends of the clamp guide trackways for separating the skin from a carcass of the animal as the clamp carriages and the clamp body move along the clamp guide trackways from the entry ends toward the output ends, upper and lower roller guide trackways mounted on the upper and lower base frame members adjacent the knife member, roller carriages mounted on the roller guide trackways for moving therealong, and a roller rotatably



mounted on the roller carriages and movable therewith between a retracted position at which the roller is spaced from the knife member and an advanced position adjacent the knife member and spaced therefrom sufficiently to permit the skin to pass between the knife member and the roller.

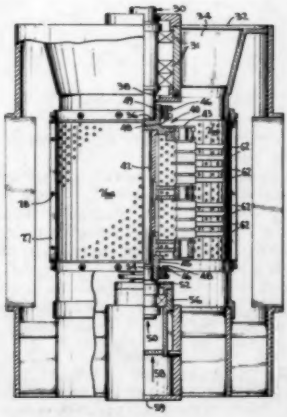
---

**4,369,548**

## DEPITHER

**Frank J. Malinak, 40 Columbus Dr., South, Hamilton, Ohio 45013**

**Filed Jul. 23, 1980, Ser. No. 171,956**
**Int. Cl.³ D01B *1/30*; B02C *13/18***
**U.S. Cl. 19—26** **13 Claims**



1. A fiber conditioner for depithing fibrous megitable material comprising:

(a) an upright casing supported by a frame and having a top opening for receiving said material and a bottom portion adjacent to said frame;

(b) a screen comprising a plurality of independently removeable sections detachably connected to one another, said screen positioned within and spaced from said casing;

(c) at least one hammer assembly rotatably mounted within said screen for beating and separating material received through said top opening, said at least one assembly comprising a plurality of hammers for beating material against said screen;

(d) a multi-piece shaft for rotating said at least one assembly, said shaft comprising an upper stub shaft assembly mounted adjacent to said top opening, a distinct lower stub shaft assembly mounted adjacent to said enclosure bottom, and a distinct rotor shaft assembly intermediate said two stub shaft assemblies, said rotor shaft assembly being connected to said at least one hammer assembly, whereby each of said assemblies removed from said conditioner by removing at least one of said screen sections and removing said assembly through the space created by the removal of said at least one screen section;

(e) means for rotatably driving said upper stub shaft assembly; and

(f) means for connecting the upper stub shaft assembly and the rotor shaft assembly in secure abutting relationship such that rotation of said upper stub shaft assembly will rotate said rotor shaft assembly and said at least one hammer assembly, said connecting means comprising a first ringfeder for securely clamping one end of said rotor shaft assembly about one end of said upper stub shaft assembly, a second ringfeder for securely clamping a second end of said rotor shaft assembly about one end of said lower stub shaft assembly, and means for forcing said lower stub shaft upwardly into abutment with said rotor shaft assembly and said rotor assembly into abutment with said upper stub shaft assembly.

---

**4,369,549**

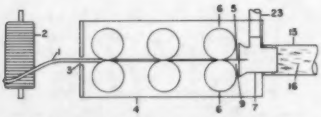
## BLENDING METHOD USING A ROVING DISINTEGRATOR-DISPENSER

**John H. Sanders, Newport News, Va., assignor to Badische Corporation, Williamsburg, Va.**

**Filed May 16, 1980, Ser. No. 150,517**

**Int. Cl.³ D01G *13/00*; D01H *5/22***

**U.S. Cl. 19—145.7** **12 Claims**



1. A method of blending a primary staple with a secondary staple, comprising the steps of:

(a) drafting a textile roving in a drafting frame;

(b) exerting a continuous pulling force on a drawn roving with an air flow amplifier which pulls continuously upon the drawn roving in both disintegrate the drawn roving into the secondary staple and to transport the secondary staple to a blending machine;

(c) blending the secondary staple with the primary staple on a blending machine already working the primary staple.

---

**4,369,550**

## METHOD OF LEVELLING OUT VARIATIONS OF A FIBRE SLIVER AND APPARATUS FOR IMPLEMENTING THE METHOD

**Hanspeter Meile, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland**

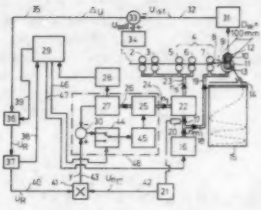
**Filed Mar. 16, 1981, Ser. No. 244,050**

**Claims priority, application Switzerland, Mar. 28, 1980, 2459/80**

**Int. Cl.³ D01H *5/32, 5/38***

**U.S. Cl. 19—240** **16 Claims**

1. Method of levelling out variations in linear density of a fibre sliver drafted from a plurality of fibre slivers in a drafting arrangement of an autolevelling drawframe, the linear density of which sliver is measured at the exit of the drafting arrangement and is compared with a preset value, a signal proportional to deviations in linear density being transmitted to a control device, which in turn transmits the adaptation commands using an adaptation value to adaptation means, which adjust the



sliver input speed using a differential gear arrangement driven by the main motor and by a control motor, until the preset value is reached, characterized in that the adaptation value transmitted to the adaptation means (48) is formed by the multiplication product of a voltage proportional to the rotational speed of the motor and of a voltage determined by the deviation in linear density.

---

**4,369,551**

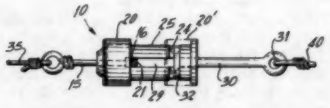
## QUICK RELEASE DEVICE FOR FISHING LEADER LINES

**Juan Heredia, 2711 SW. 93rd Ct., Miami, Fla. 33165**

**Filed May 11, 1981, Ser. No. 262,229**

**Int. Cl.³ A44B *17/00***

**U.S. Cl. 24—201 A** **3 Claims**



1. A quick release device for attaching and detaching a fishing line to a leader line, comprising:

(a) a swivel body member of substantially tubular shape provided with a partially longitudinal through slot having an axial aperture extending longitudinally from the inner end of said slot to the end of said swivel body member and the other end being provided with a built-in recess and a radial slot relatively adjacent to said recess;

(b) a swivel pin partially housed within said aperture and tied to said fishing line;

(c) a T-shape pin having an eye termination on one end that is connected to said leader line and a T-shape termination on the other end that is removably positioned inside said radial slot, and

(d) means for locking said T-shape pin in place.

---

**4,369,552**

## LOCKING ASSEMBLY

**Saul Gottlieb, 159 W. 53rd St., Apt. 23C, New York, N.Y. 10019**

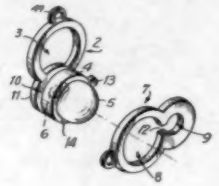
**Filed Mar. 26, 1981, Ser. No. 247,723**

**Int. Cl.³ A44B *19/00***

**U.S. Cl. 24—230 R** **18 Claims**

1. A clasp device including: a female member defined by an annular body; a male member, said male member being adapted to be received into said female member; said female member being of unitary construction having a first opening and a second opening; said first and second openings being spaced apart from one another and having a passage way formed

therebetween; said male member comprises an assembly having a base member and a projecting member, said projecting member being affixed to and spaced apart from said base member through a positioning means disposed therebetween in a space formed between said base member and said projecting member, said positioning means being slidable through said passage way of said female member, after said male member is inserted into said first opening of said female member and said female member is positioned between said base member and



said projecting member, said male member being slidable into locking engagement with said female member by urging said positioning means through said passageway into said second female opening, whereby locking of said male and female members takes place by rotational movement of said male member to urge said positioning means to assume an orientation with respect to said second female opening, sufficient to inhibit slidable movement of said male member with respect to said female member, through said passage way.

---

**4,369,553**

## BUCKLE

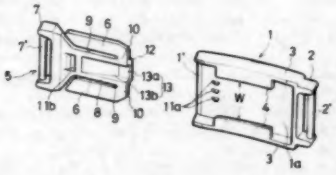
**Takuo Yuda, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan**

**Filed Apr. 13, 1981, Ser. No. 254,552**

**Claims priority, application Japan, Apr. 18, 1980, 55-51813[U]**

**Int. Cl.³ A44B *19/00***

**U.S. Cl. 24—230 R** **4 Claims**



1. A buckle comprising a receptacle member adapted to be fastened to one end of a belt and an insertion member adapted to be fastened to the other end of said belt and brought into separable union with said receptacle member; said receptacle member including a first portion of an engaging means formed on the rear surface of said receptacle member and a socket comprising two vertically opposed side walls formed on the rear surface of said receptacle member and guide wings extended from said side walls toward each other over the rear surface of said receptacle member; said insertion member including a central piece of a width smaller than the distance between said two guide wings and provided on the front surface thereof with another portion of an engaging means and a pair of guide pieces of a thickness small enough for passage between the rear surface of said receptacle member and said guide wings, connected to the leading end of said central piece and separated by intervening slits from the upper and lower ends of said central piece; said insertion member being inserted into said receptacle member through one end of said socket thereby bringing said receptacle member and said insertion member into inextricable engagement by the engagement of said engaging means portions.

---

**4,369,554**

## METHOD FOR THE MANUFACTURE OF NON-WOVEN TEXTILE FABRICS

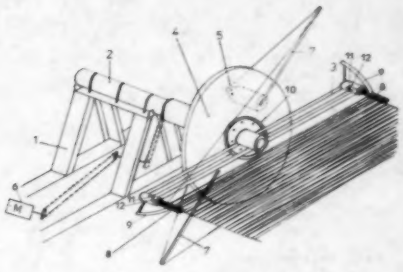
**Jean Carinier, Le Cheylard, and Charles Vandermarliere, Pont-de-Cherruy, both of France, assignors to Les Fils d'Auguste Chomarat & Cie, Paris, France**

**Division of Ser. No. 898,577, Apr. 21, 1978, Pat. No. 4,242,779. This application Dec. 24, 1980, Ser. No. 219,596**

**Claims priority, application France, Apr. 27, 1977, 77 13991; Jul. 13, 1977, 77 22475**

**Int. Cl.³ D04H *3/04***

**U.S. Cl. 28—101** **2 Claims**



1. A method of forming a web of weft yarns, which may be incorporated in a non-woven fabric, wherein the weft yarns are strictly parallel to one another and run transversely relative to the length of the web, said method comprising the steps of:

(a) providing a pair of laterally spaced, substantially parallel helical yarn guide members, each comprising a plurality of individual helices imbricated with one another, wherein the number of helices is equal to the number of weft yarns being fed;

(b) rotating each of said helical yarn guide members about its own axis;

(c) rotating an even number of at least four yarn feed elements about an axis parallel to and between said two laterally spaced helical yarn guide members, wherein the yarn feed elements are rotated at a speed which is one-half that of the individual helices;

(d) feeding a weft yarn through each of said yarn feed elements whereby the weft yarns are wrapped around said laterally spaced helical yarn guide members;

(e) providing a yarn guide ramp adjacent each helical yarn guide member, each yarn guide ramp including two fixed guides tangential to the helical yarn guide member, one upstream inclined away from the direction of the advance of the web, and one downstream inclined toward the direction of the advance of the web, and at a distance from one another equal to the pitch of the helical yarn guide member minus the thickness of the material forming the helical yarn guide member; and

(f) guiding said weft yarns on said yarn guide ramps so that yarns from a first half of the yarn feed elements, said first half including feed elements adjacent one to the other and having their outlet ends positioned upstream of the upstream fixed guides, are laid down in a common vertical plane and guided into spaces between turns of the helices by the upstream fixed guide for each helical yarn guide member and yarns from a second half of the yarn feed elements, said second half including feed elements adjacent one to the other and having their outlet ends positioned downstream of the downstream fixed guides, are laid down in a common plane and guided into spaces

between turns of the helices by the downstream fixed guide for each helical yarn guide member.

---

**4,369,555**

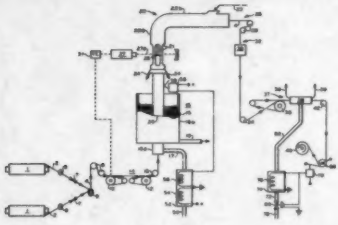
## YARN PROCESSING APPARATUS

**Ronnie D. Nikkel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 955,047, Oct. 26, 1978, Pat. No. 4,235,000, which is a division of Ser. No. 822,177, Aug. 5, 1977, Pat. No. 4,135,511, which is a continuation of Ser. No. 692,713, Jun. 4, 1976, abandoned. This application Jun. 9, 1980, Ser. No. 157,584**

**Int. Cl.³ D02G *1/12, 1/16, 1/20***

**U.S. Cl. 28—221** **13 Claims**



1. Apparatus comprising:

yarn crimping means for heating a yarn with a heated fluid and producing a yarn plug;

fluid heating means, comprising first and second heating elements, for selectively heating a fluid to either a first temperature by operation of said first heating element or to a second temperature by simultaneous operation of said first and second heating elements, said second temperature being the temperature used for crimping the yarn and said first temperature being the temperature used for stringing up the apparatus, said second temperature being a higher temperature than said first temperature;

means connecting the fluid heating means to the yarn crimping means for passing of the heated fluid from the fluid heating means to the yarn crimping means;

control means positioned downstream of said crimping means for regulating the temperature of the heated fluid heated by the heating means to the first temperature or the second temperature in response to whether the yarn plug is detected at a predetermined point by the control means so that the heated fluid is heated to the first temperature if the yarn plug is not detected at said point and the heated fluid is heated to the second temperature if the yarn plug is detected at said point.

11. Apparatus comprising:

yarn heating means for heating a yarn with a heated fluid;

fluid heating means for heating a fluid to a temperature;

valve means for shutting off the flow of fluid to said fluid heating means;

means connecting the fluid heating means to the yarn heating means for passage of the heated fluid from the fluid heating means to the yarn heating means;

constant tension winding means positioned to wind the yarn heated in said yarn heating means; and

fluid control means for maintaining said valve means open to permit the passage of fluid to the fluid heating means and heating the fluid to said temperature in response to the winding of yarn so that heating fluid is passed to the yarn heating means only if yarn is being wound, said fluid control means comprising means for actuating said valve means to shut off the flow of fluid to said fluid heating means when yarn is not being wound.

**4,369,556**

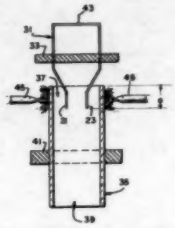
## METHOD OF MAKING A PHOTOFLASH LAMP HAVING NEW LEAD SEAL STRUCTURE

**Andre C. Bouchard, Peabody; Harold H. Hall, Jr., Marblehead, and Frederick A. Loughridge, Ipswich, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Jul. 21, 1980, Ser. No. 170,509**

**Int. Cl.³ H01J *9/32***

**U.S. Cl. 29—25.15** **17 Claims**



1. A method of making an electrically-activated photoflash lamp, said method comprising:

securedly retaining an elongated glass tubing member having first and second opposing open end portions such that said first open end portion is located vertically above said second open end portion;

positioning a pair of spaced-apart electrical conductors within said first open end portion of said glass tubing member such that said conductors project downwardly in a vertical direction a predetermined distance within said first open end portion;

heating preselected external areas of said first open end portion of said glass tubing member having said conductors projecting therein to a preestablished temperature to cause said first open end portion of said glass tubing member to deform and surround said conductors projecting downwardly therein and provide a seal therewith, said deformation resulting in the formation of a groove along the internal surface of said sealed first end portion such that said conductors are located within and along the deepest portion of said groove, the glass material of said heated first end not covering the terminations of said conductors, said terminations being substantially flush with the internal surface of said glass material;

applying a quantity of primer material through said opposing second open end portion of said glass tubing member such that said primer material will occupy said groove and contact said terminations of said conductors so as to bridge said terminations;

positioning a predetermined quantity of filamentary combustible material within said glass tubing member through said second open end portion; and thereafter

tipping off said second open end portion of said glass tubing member to provide a seal thereat and thereby provide a hermetically sealed envelope, said method not including utilization of a glass bead or similar member in contact with the portions of said electrical conductors which project downwardly within said first open end portion of said glass tubing member during said heating and deformation thereof.

---

**4,369,557**

## PROCESS FOR FABRICATING RESONANT TAG CIRCUIT CONSTRUCTIONS

**Jan Vandebult, 32 Averill St., Topsfield, Mass. 01983**

**Filed Aug. 6, 1980, Ser. No. 176,061**

**Int. Cl.³ H01G *4/26*; H01F *41/04***

**U.S. Cl. 29—25.42** **19 Claims**

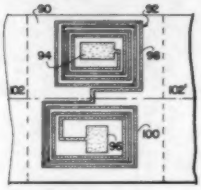
1. A method for fabricating a plurality of individual planar

resonant tags, each tag having at least one self-contained operative tuned circuit with integrally formed circuit elements including an inductor and a capacitor, the method comprising the steps of:

providing an insulative substrate web of material of predetermined thickness and dielectric characteristics and having first and second faces and a conductive surface on said first face;

printing on said conductive surface with an etchant-resistive material a repetitive circuit pattern defining an inductor and first and second conductive areas electrically connected to respective ends of said inductor;

etching said conductive surface to remove unprinted portions of said conductive surface thereby to provide a




repetitive circuit pattern conforming to said printed circuit pattern;

folding said web and said repetitive circuit pattern such that a double layer of the insulative substrate web lies between the folded printed circuit pattern and such that the first and second conductive areas are at least in part mutually aligned to form respective plates of said capacitor, with said double layer of the insulative substrate web therebetween forming a dielectric of the capacitor;

sealing the double layer of the insulative substrate at least in a region over which the first and second conductive areas are mutually aligned, thereby fixing the capacitance of the capacitor; and

separating said web between adjacent said repetitive circuit patterns to provide individual planar resonant tags.

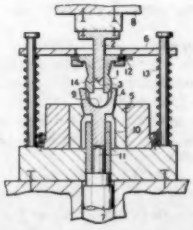
---

**4,369,558**

## OUTER RACE WORKING METHOD AND APPARATUS THEREFOR

**Yasuo Iwata, and Hisao Shirai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 1, 1980, Ser. No. 211,848**
**Claims priority, application Japan, Sep. 10, 1980, 55-125692**
**Int. Cl.³ B21K *1/04***
**U.S. Cl. 29—148.4 R** **5 Claims**




1. An outer race working method comprising the steps of:

ironing the inner surface of the groove, which is formed in the roughly shaped outer race workpiece of a Birfield type constant-velocity ball joint such that it is made axially straight at its portion above the joint center, while being made suitably smaller than a working mandrel, and such that it is made to have an axial curvature at its portion below the joint center, so that said groove may become a ball rolling groove, by inserting a hexagonal-pillar guide punch and a split mandrel composed of six segments into said groove;

forming both a center hole corresponding to the center of said ball rolling groove and a face for providing a reference for the axial center of the groove center at a later half of the groove ironing step; and

ironing said roughly shaped workpiece by means of an ironing die, whereby the ball rolling groove is plastically worked all over its surface from its upper portion to its lower portion.

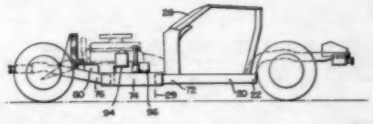
---

**4,369,559**

## METHOD OF CONVERTING A SPORTS CAR TO A REPRODUCTION OF A VINTAGE MOTOR CAR

**Charles W. Phillips, 1519 SW. 6 Ter., Boca Raton, Fla. 33432**

**Filed Aug. 6, 1980, Ser. No. 175,640**
**Int. Cl.³ B23P *17/00*; B60R *27/00***
**U.S. Cl. 29—401.1** **15 Claims**




1. A method of converting a production car to to provide a lengthened engine compartment and a lengthened wheelbase to form a vintage car which comprises the steps of:

removing the engine compartment hood, front and rear fenders, and the front and rear body sections from the frame of said production car;

severing the frame transversely at the engine compartment and longitudinally separating the severed rear and front sections of the frame thereat;

inserting two longitudinal frame segments between the separated sections of the frame at the engine compartment and joining each of said inserted longitudinal frame segments at each end to the adjoining sections of the frame;

fastening a cross member in the engine compartment so as to extend from one inserted frame segment to the other inserted frame segment;

mounting the engine on said cross member between said at least two longitudinal frame segments; and

attaching an elongated engine compartment top hood, rear and front fenders, windshield cowl, grille, vintage style wheels and a vintage style outer body to the frame of said production car.

---

**4,369,560**

## METHOD OF MANUFACTURING SLIDE FASTENERS

**Minoru Ueda, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan**

**Division of Ser. No. 105,899, Dec. 21, 1979, Pat. No. 4,300,283.**
**This application Jul. 31, 1981, Ser. No. 288,801**
**Claims priority, application Japan, Dec. 29, 1978, 53-162847**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—408** **2 Claims**

1. A method of manufacturing slide fasteners, comprising the steps of:

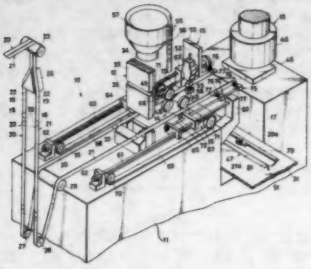
(a) feeding a pair of continuous slide fastener stringers having longitudinally spaced, element-free portions, along a longitudinal path;

(b) during said feeding, threading one of said slide fastener stringers through a slider fixedly held in said path;

(c) stopping said feeding;

(d) severing the slide fastener stringers transversely across

one of said element-free portions which is behind said slider; and



(e) forming a separable end stop including a pin and a receptive box respectively on the slide fastener stringers at their leading ends in advance of said slider.

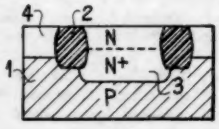
---

**4,369,561**

## PROCESS FOR ALIGNING DIFFUSION MASKS WITH RESPECT TO ISOLATING WALLS OF COFFERS IN INTEGRATED CIRCUITS

**Eugene Tonnel, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Dec. 4, 1980, Ser. No. 212,974**
**Claims priority, application France, Dec. 21, 1979, 79 31483**
**Int. Cl.³ H01L *21/22***
**U.S. Cl. 29—576 W** **7 Claims**




1. A process for aligning diffusion masks with respect to isolating walls of coffers in integrated circuits, these coffers being formed in a layer having a first type of conductivity and a thickness less than 3 microns obtained by epitaxial growth on a substrate having a second type of conductivity in which there are implanted, in zones corresponding to the bottom of the coffers, doping impurities of the first type of conductivity, these coffers being limited laterally by isolating walls; the improvement comprising implanting doping impurities of the second type of conductivity in the substrate along the contour of the isolating walls and then after formation of the epitaxial layer in causing these impurities to diffuse towards and as far as the surface of the epitaxial layer; and further comprising the step which consists in making the upper surface flush zone of the insulating walls visible at the surface of the epitaxial layer in order to facilitate alignment.

---

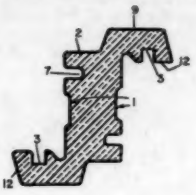
**4,369,562**

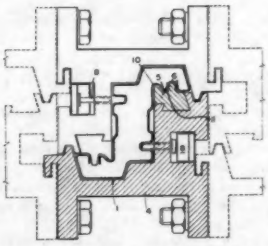
## PROCESS FOR THE MANUFACTURE OF A PROFILE FOR METAL JOINERY HAVING A THERMAL GAP

**Christian Lyonnet, Fontenay sous Bois, France, assignor to Societe de vente de L'Aluminium Pechniney, Paris, France**

**Filed Apr. 6, 1978, Ser. No. 894,028**
**Claims priority, application France, May 11, 1977, 77 15182**
**Int. Cl.³ B22D *11/126***
**U.S. Cl. 29—527.1** **9 Claims**

1. A process for the manufacture of composite profiles of large dimension having a thermal gap, said profiles being composed of two thin metal profiles combined with a foamed plastic core, comprising providing a two piece mold, each piece of said mold having an internal face of generally L-shape in cross section, applying the two thin and flexible metal profiles of generally L-shape in cross section each onto a respective one of said internal faces, each L-shaped profile having a long branch and a short branch with each branch terminating in a free end, said profile being applied with the face end of a long branch of one profile adjacent the face end of a short




branch of the other profile and with the free ends of the two profiles being separated by elastomer jointing integral with the shell, pressing the jointings between the corresponding edges of the profile, said jointing having an end base with a groove, and then injecting a foaming material between the two metal profiles at one end of said mold in which the long branch of the L is turned towards the exterior in a direction opposite to the small branch of the L, corresponding to an N-shaped section forming a rib followed by a groove which engages in the end groove in the jointing.

---

**4,369,563**

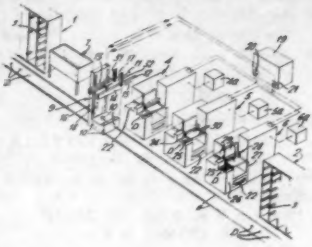
## AUTOMATED MACHINE TOOL INSTALLATION WITH STORAGE MEANS

**David T. N. Williamson, London, England, assignor to Molins Limited, London, England and John Conventry Smith, Jr., Arlington, Va.**

**Continuation-in-part of Ser. No. 695,817, Dec. 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 578,318, Sep. 9, 1966, abandoned, and Ser. No. 636,993, May 8, 1967, abandoned. This application Oct. 29, 1970, Ser. No. 85,289**
**Claims priority, application United Kingdom, Sep. 13, 1965, 38937/65; May 12, 1966, 21223/66; Mar. 15, 1967, 12196/67; May 5, 1967, 21109/67**
**Int. Cl.³ B23Q *7/00***
**U.S. Cl. 29—568** **184 Claims**

1. A machine tool installation for machining workpieces of different types requiring different machining operations and comprising a plurality of complementary numerically-controlled machine tools located adjacent a predetermined path, a store located adjacent said path and having a plurality of storage means for storing workpieces, transport means for transporting workpieces between the store and the machine tools along said path from which there is access to any of said storage means in the store and to any of the machine tools and

operable to convey selected workpieces independently of other workpieces, and a central programmed control means and means connecting said central programmed control means with each of said machine tools and with said transport means to control movement of each of said workpieces by said transport means between a predetermined selection of the storage



means in the store and a predetermined selection of the machine tools, and to control predetermined selected machining operations performed by each of the selection of machine tools on the workpiece, the pattern of movement of said workpieces along said path and the machining operations performed by said selection of machine tools on said workpieces being different for each of said types of workpieces.

---

**4,369,564**

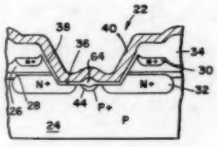
## VMOS MEMORY CELL AND METHOD FOR MAKING SAME

**William R. Hiltpold, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.**

**Division of Ser. No. 89,612, Oct. 29, 1979, Pat. No. 4,271,418. This application Dec. 22, 1980, Ser. No. 219,296**

**Int. Cl.³ H01L** *21/20*

**U.S. Cl. 29—571** **5 Claims**




1. A method for making a semiconductor memory device having a plurality of memory cells, each memory cell being capable of storing one bit, said method comprising the steps of:

providing a substrate of semiconductor material of a first conductivity type;

forming buried source regions of a second conductivity type opposite to said first conductivity type in said substrate;

forming an epitaxial layer over said substrate and said source region;

forming bit lines of said second conductivity type in said epitaxial layer;

forming an insulating layer over said epitaxial layer and said bit lines;

forming elongated V-groove recesses between pairs of bit lines and between pairs of buried source regions;

forming a transverse channel stopping region between the ends of each said recess;

forming a dielectric layer within each said recess; and

forming conductive word lines extending perpendicular to said bit lines and into said recesses to form transistor gate means, wherein each said recess provides two distinct memory cells.

**4,369,565**

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING ETCH AND REFILL TO FORM ISOLATION REGIONS

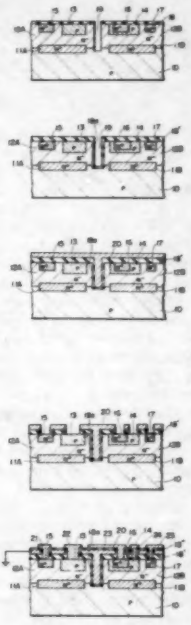
**Akira Muramatsu, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 21, 1980, Ser. No. 179,983**

**Claims priority, application Japan, Aug. 31, 1979, 54-110423**

**Int. Cl.³ H01L** *21/283, 21/76*

**U.S. Cl. 29—580** **12 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor epitaxial layer on a semiconductor substrate;

forming a groove extending from a main surface of said epitaxial layer into said semiconductor substrate through said epitaxial layer thereby to divide said epitaxial layer into at least two island parts;

depositing a semiconductor layer on a first insulating film which is formed on the surface of said groove and on the surfaces of said island parts, thereby to fill said groove;

selectively removing at least one portion of said semiconductor layer overlying each of said island parts thereby to form a plurality of holes in said semiconductor layer, corresponding to circuit elements formed in each of said island parts, and to provide a remaining semiconductor layer that continuously extends over said groove and said at least two island parts except for said plurality of holes;

forming a second insulating film on the remaining surface of said semiconductor layer; and

forming electrode layers for circuit elements formed in each of said island parts so as to extend over a surface of said second insulating film into the corresponding hole of said semiconductor layer.

4,369,566

## PROCESS OF PRODUCING FRONT COMMUTATORS FOR THE ROTORS OF DIRECT CURRENT MACHINES

Karel Skrdlant, and Lubor Milota, both of Prague, Czechoslovakia, assignors to PIKAZ, inzenyrsky podnik, Prague, Czechoslovakia

Filed Apr. 30, 1981, Ser. No. 259,144
Claims priority, application Czechoslovakia, Apr. 30, 1980, 3055-80
Int. Cl.³ H01R 43/08
U.S. Cl. 29—597 6 Claims

1. A process of producing front commutators for the rotors of direct current machines, comprising forming a linear shaped copper strip, said shaped strip incorporating a plurality of serially connected pairs of segment halves, the halves of each pair being mirror images of each other, the shaped strip having a generally flat lower surface and an upper part which is shaped into said plurality of connected pairs of segment halves, the segment halves of each pair thereof having plane parts which include an obtuse angle between them, a cut-out portion in the upper part of the shaped strip between the two segment halves of each pair thereof, successive pairs of segment halves being connected by a thin section of the shaped strip, the parts of the strip between each successive pair of segment halves and outwardly from the slots at the ends of the segment halves in each pair thereof connected by a strap having plateaus of reduced height; after the formation of said shaped strip bending it alternately in an upward direction in the locations of the cut-outs for bending and in a downward direction in the locations of the connecting straps to form an intermediate product in which both plane upper surfaces of the segment halves of each pair thereof are pressed together and the plateaus of reduced height form a groove for receiving a rotor winding, and further bending the resulting intermediate product into a circle so that there is formed a commutator ring with a plurality of confronting pairs of segment halves disposed in radial directions; between the bent, initially upper shaped parts of the shaped strip there being formed slots for the reception of the rotor winding between confronting segment halves; and between the bent, initially lower linear parts of the shaped strip there being formed air gaps between the consecutive segments of the commutator.

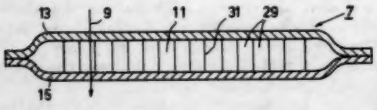
---

4,369,567

## METHOD OF MANUFACTURING A PERMANENT MAGNET WHICH IS TO BE ARRANGED IN AN AIR GAP OF A TRANSFORMER CORE

Gerrit Bosch; Arnoldus W. Kok, and Harmen Giethoorn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1980, Ser. No. 185,842
Claims priority, application Netherlands, Sep. 25, 1979, 7907115
Int. Cl.³ B65B 61/24; B26F 3/00; H01F 7/00, 7/02
U.S. Cl. 29—607 5 Claims



1. A method of manufacturing a plate-shaped permanent magnet which is to be arranged in an air gap of a core for a transformer or choke coil and which includes a number of permanent magnetic portions which are made of a metal alloy having a high magnetic remanence and which are magnetized perpendicularly to the plane of the plate, the method comprising the steps of fixing and attaching a plate of the alloy between two insulating foils to form a sandwich assembly in which the magnetic plate is attached to the two insulating foils, arranging this assembly on a flat backing and rolling a cylinder whose outer surface is provided with grooves over said assembly in two mutually perpendicular directions to break the plate into a number of permanent magnetic portions.

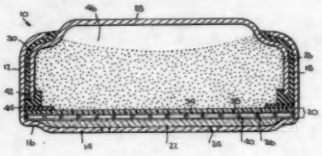
---

4,369,568

## METHOD FOR MANUFACTURING CELLS UTILIZING CENTRIFUGING TECHNIQUES

Robert B. Dopp, Madison, Wis., assignor to Ray-O-Vac Corporation, Madison, Wis.

Filed Feb. 9, 1981, Ser. No. 232,431
Int. Cl.³ H01M 4/04, 4/38
U.S. Cl. 29—623.2 5 Claims



1. An improved method of manufacturing a metal-air button cell, the method including:

(a) providing a cathode can,

(b) placing a cathode assembly and a separator into the cathode can to form a cathode portion,

(c) providing an anode cover,

(d) placing a grommet upon the anode cover,

(e) placing anode material into the anode cover to form an anode portion,

(f) fitting the anode portion and fitting it into the cathod portion,

(g) crimping the cathode cap upon the grommet to form a leak-resistant cell, wherein the improvement comprises centrifuging the cell to form a void between the anode material and the anode cover.

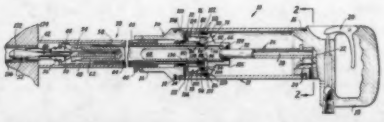
---

4,369,569

## TUBE-PULLING APPARATUS

Robert S. Armstrong, Jr., and Robert S. Armstrong, both of Manasquan, N.J., assignors to Armstrong & Sons, Manasquan, N.J.

Filed Jun. 6, 1981, Ser. No. 269,906
Int. Cl.³ B23P 19/04, 15/26
U.S. Cl. 29—726 6 Claims



1. Tube-pulling apparatus, comprising a cylinder, having a front end and a rear end; a stationary feed pipe extending into said cylinder from said rear end thereof, said feed pipe including supplying means for supplying fluid to said cylinder; a first piston slideably mounted on said feed pipe for reciprocating movement in said cylinder, said first piston including an interior cavity; a second piston mounted for reciprocating movement within said cavity of said first piston, said second piston

cooperating with said first piston to form a chamber therebetween; expandable gripping means for releasably gripping an inner wall of a tube to be pulled from a tube sheet when said gripping means is expanded, said gripping means being fixedly connected to said second piston, whereby said gripping means is moveable conjointly with said second piston; expanding means for expanding said gripping means, said expanding means being fixedly connected to said first piston, whereby said expanding means is moveable conjointly with said first piston; first providing means for providing fluid communication between said feed pipe and said chamber, whereby fluid supplied to said chamber move said first piston towards said rear end of said cylinder while urging said second piston towards said front end of said cylinder; second providing means for providing fluid communication between said chamber and a front portion of said cylinder after said first piston has moved rearward a predetermined distance relative to said second piston, whereby fluid supplied to said front portion of said cylinder from said chamber causes the conjoint rearward movement of said first and second pistons, said second providing means including first inhibiting means for inhibiting fluid to flow from said chamber to said front portion of said cylinder until said first piston has moved rearward said predetermined distance; third providing means for providing fluid communication between said front portion of said cylinder and said chamber during the forward movement of said first piston in said cylinder, whereby fluid in said front portion of said cylinder is exhausted therefrom through said third providing means during the forward movement of said first piston in said cylinder, said third providing means including second inhibiting means for inhibiting fluid to flow from said chamber to said front portion of said cylinder at least until said first piston has moved rearward said predetermined distance, said second inhibiting means cooperating with said first inhibiting means to prevent any rearward movement of said second piston and hence said gripping means until said first piston and hence said expanding means move rearward said predetermined distance, thereby preventing rearward movement of said second piston and hence said gripping means in situations where said gripping means fully engages a tube to be pulled before said first piston and hence said expanding means move rearward said predetermined distance, whereby tube-pulling operations are automatically aborted in such situations to prevent damage to a tube sheet from which a tube is to be pulled.

---

**4,369,570**

## APPARATUS FOR INSERTING INSULATING DISC IN CELL CONTAINER

**James A. Madden, and Kenneth C. LeDuc, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.**

**Continuation of Ser. No. 923,261, Jul. 10, 1978, abandoned. This application Feb. 6, 1980, Ser. No. 119,013**

**Int. Cl.³ B23P** *19/04*

**U.S. Cl. 29—730** **2 Claims**

1. An apparatus for aligning and inserting insulator discs, having apertures therein, into the open ends of electro-chemical cells each of which has an upstanding terminal, said apparatus comprising:

a plunger having a central bore large enough to encircle the upstanding terminals of said cells;

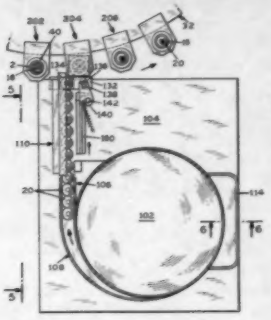
means for positioning one of said cells with its upstanding terminal in alignment with the axis of said plunger bore;

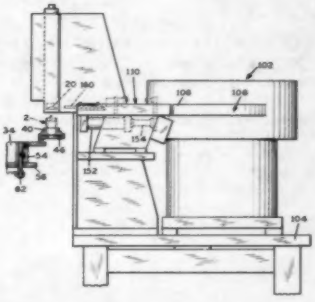
means for advancing said plunger axially along a path of travel toward said positioned cell;

means for releasably holding one of said discs with the aperture thereof in registration with said plunger bore, said holding means being engageable by said plunger upon advancement thereof for causing said holding means to release said one disc, said plunger upon further advancement thereof pressing said one disc into the open end of said cell, with the upstanding terminal protruding through the aperture of the disc and into said plunger bore;

shuttle means for conveying one of said discs to a site alongside said path of travel;

actuator means supported for movement across said shuttle to said path of travel for displacing said one disc from said shuttle means to said holding means, said actuator means movable independent of relative movement between said plunger and said releasable holding means; and





latch means coupled to said shuttle means, and positioned for engagement with said actuator means, an advancement of said actuator means operating said latch means to drive said shuttle means from a first position wherein said one disc may be loaded onto said shuttle means to a second position wherein said one disc is alongside said path of travel.

---

**4,369,571**

## SHUTTLE PLATE GUIDE FOR AUTOMATIC WINDING MACHINES

**Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.**

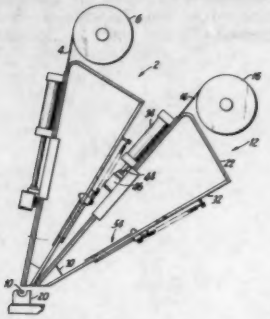
**Continuation of Ser. No. 888,535, Mar. 21, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,705**

**Int. Cl.³ B23P** *19/04*

**U.S. Cl. 29—731** **7 Claims**

1. In an apparatus for feeding and guiding a separator strip and a battery plate blank to an arbor for coiling said strip and blank into a coil, the apparatus having an arbor for receiving the end of a separator strip and a battery plate blank and for coiling said strip and said blank into a coil, a first frame member, a second frame member, said first and said second frame members converging toward said arbor, feed means on said first frame member for feeding a separator strip along said first frame to said arbor, platform means on said second frame member for receiving a plate blank, means on said platform means for pushing said platform means along said second frame

member for feeding a plate blank thereon to said separator strip and said arbor, means for retracting said platform means when said pushing means is released, and wherein said second frame member includes guide means for said platform means and said



retracting means includes a spring which is tensioned as said platform is pushed along such second frame member and which retracts said platform means when said pushing means is released.

---

**4,369,572**

## METHODS OF MAKING ELECTRICAL CONNECTORS

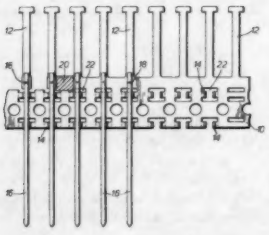
**Sidney H. Atkins, Towcester, England, assignor to Plessey Overseas Limited, Essex, England**

**Filed Aug. 25, 1980, Ser. No. 180,869**

**Claims priority, application United Kingdom, Aug. 31, 1979, 7930351**

**Int. Cl.³ H01R *43/02***

**U.S. Cl. 29—879** **6 Claims**



1. A method of making electrical connectors, comprising the steps of:

producing an elongate planar strip, said elongate planar strip being shaped with a plurality of separate elongate contact portions extending outwardly at right angles with respect to one side of the longitudinal axis of said strip, said separate elongate portions being adapted to form electrical contact members, said strip also being formed with spaced apart lugs projecting perpendicularly from the plane of said strip and located in line with each of said separate elongate contact portions;

locating a plurality of rigid contact legs on said elongate planar strip, each contact leg being supported by said spaced apart lugs axially in line with one of said separate elongate contact portions, with one end being adjacent to the inner end of said elongate contact portion;

welding each said contact leg to said elongate planar strip at a spot adjacent to said one end; and

severing each said elongate contact portion from said elongate planar strip;

whereby said elongate contact portion is retained on said contact leg by said weld, and said contact leg is retained on said elongate planar strip by said spaced apart lugs.

---

**4,369,573**

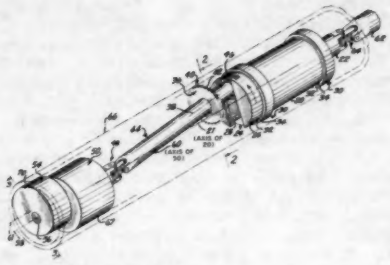
## PIPE CUTTER

**Steven Vitale, 269 Greencroft Ave., Staten Island, N.Y. 10308**

**Filed Oct. 6, 1980, Ser. No. 194,219**

**Int. Cl.³ B23D *21/14***

**U.S. Cl. 30—105** **25 Claims**



23. A pipe cutter comprising:

(a) a body having a body axis;

(b) means for supporting said body within the pipe to be cut so that said body is rotatable about said body axis; and

(c) a blade swingably connected to said body for orbital movement relative thereto about a pivot axis transverse to said body axis, said blade being movable between a retracted position and an extended position in which said blade protrudes beyond the periphery of said body.

---

**4,369,574**

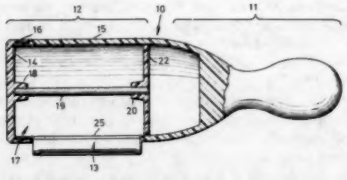
## PEEL CONCENTRATING CLEARANCE BOX

**Liao Hsien-Sen, No. 128, Pi-Shan Rd., Tsao-Tun Town, Nan-Tou Hsien, Taiwan**

**Filed Dec. 23, 1980, Ser. No. 219,523**

**Int. Cl.³ A47J *17/02***

**U.S. Cl. 30—123.5** **6 Claims**



1. A peeling device comprising in combination:

a column shaped box having a necked down handle portion at one end and a threaded lip at a remote end,

a threaded lid capping said remote end which includes an axially extending longitudinal linkage bar fastened to a scraper plate,

said scraper plate dimensioned to snugly reside within a bore defined by an interior of said box,

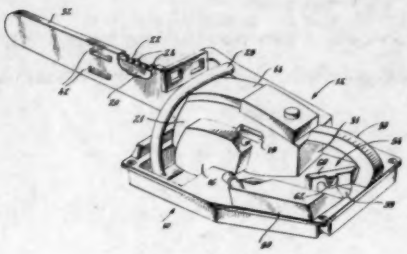
whereby removal of said cap translates said scraper plate to remove peels within said box,

and peeler means disposed on said box adapted to place peels therewithin.

## 4,369,575
## TOTE DEVICE

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Jan. 30, 1981, Ser. No. 230,304
Int. Cl.³ B65D 85/00
U.S. Cl. 30—151 14 Claims



1. A tote device for an article including a main body and a member projecting from one side of said body; said tote device comprising:

means for supporting said body when at rest including a base formed with an upwardly open recess configured to receive at least a portion of said body;

scabbard means mountable on said member to enclose and protect a portion thereof;

first means for linking said scabbard means, when mounted on said member, to said base in the region of said one side of said body; and

second means for linking said base to said body when said portion of said body is received in said recess, at a location remote from said one side;

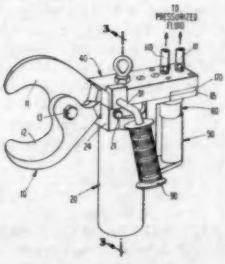
whereby upward movement of said body and said member results in upward movement of said scabbard means and, by interaction of said scabbard means and said body with said base through said first and second linking means, of said base.

---

## 4,369,576
## HAND-HELD CABLE CUTTER

Arthur K. McVaugh, 2009 Old Sumneytown Pike, Harleysville, Pa. 19438

Filed May 22, 1981, Ser. No. 266,457
Int. Cl.³ B26B 15/00
U.S. Cl. 30—228 5 Claims



1. A hand-held fluid-drive cable-cutter tool comprising:

a. a pair of cutter jaws one of which is pivotally fixed and the other of which is pivotally movable;

b. a manifold having fluid passageways and input and return ports;

c. fixed means connecting said fixed jaw pivotally to said manifold;

d. a piston rod having fluid ducts therein;

e. fixed means securing one end of said piston rod to said manifold;

f. a piston head on the other end of said piston rod;

g. a piston cylinder concentric with and movable axially relative to said piston rod;

h. means connecting said cylinder pivotally to said movable cutter jaw;

i. a control handle;

j. support means supporting said control handle from said manifold;

k. a trigger;

l. spring means biasing said trigger to a position eccentric with respect to said control handle, said trigger being movable manually from said eccentric position to a position concentric with said control handle;

m. a drive spool coaxially disposed within said control handle, said spool extending through said trigger and projecting therebeyond;

n. means connecting said spool to said control handle;

o. means connecting said spool to said trigger;

p. a disc valve element having fluid ports and fluid slots;

q. a valve housing supporting said valve element for rotational movement, the projecting end of said spool being connected to said valve element so that rotational movement of said control handle provides corresponding rotational movement of said valve element;

r. fluid feed lines extending from a source of pressurized fluid to said input and return ports in said manifold;

s. a first of said fluid ducts in said piston rod extending from said one end of said piston rod to the other end of said piston rod beyond said piston head;

t. a second of said fluid ducts in said piston rod extending from said one end of said piston rod to a side surface of said piston rod before said piston head;

u. said fluid passageways in said manifold extending from said first and second fluid ducts in said piston rod to first and second ports in said disc valve element;

v. said slots in said valve element providing direct communication from said manifold input port to said return port when said valve element is in the OFF position;

w. said slots in said valve element providing communication between said manifold input and return ports and said manifold passageways when said valve element is in either of two drive positions.

---

## 4,369,577
## FEED MECHANISM FOR FILAMENT TYPE VEGETATION TRIMMER

Glenn A. Gise, East New Market, and Calvin M. Edleblute, Ridgely, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 8, 1980, Ser. No. 176,289
Int. Cl.³ A01D 50/00
U.S. Cl. 30—276 13 Claims

1. In a filament type vegetation trimmer of the variety having:

a housing,
a wand,
a handle mounted on said wand,
a prime mover mounted in said housing and having a rotary power output means,
a slinger head, drivingly coupled with said rotary power output means,
a stationary supply of filament, and
means for guiding a free end of said filament through a longitudinal passage to said slinger head, for radial rotation therewith,
a feed mechanism for releasing filament to said slinger head, said feed mechanism being positioned on said wand and comprising:
spool means for storing said filament,
indexing means associated with said spool means; and
control means which coact with said indexing means to limit the rotation of said spool, said control means being actuable to permit said spool to unwind a limited amount and a controlled amount of filament to be drawn therefrom;
wherein said indexing means comprises first and second rows of opposed, staggered teeth positioned around the circumference of said spool, and wherein said control means comprises a detent, configured to engage said first row of teeth and a control bar, operable to bring said detent into engagement with said second row of teeth; and
wherein said detent is deployed on said control bar, and wherein actuation of said control bar effects movement of said detent between said rows of teeth by means of a living hinge element.

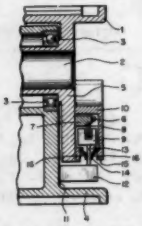
---

**4,369,578**

## ENCAPSULATED ANGLE MEASURING APPARATUS

**Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany**

**Filed Sep. 12, 1979, Ser. No. 75,136**
**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841501**
**Int. Cl.³ G01D *5/34***
**U.S. Cl. 33—1 PT** **4 Claims**



1. An apparatus for measuring the angular position of a first element, rotatably mounted with respect to a second element by means of a guide, said apparatus comprising:
an arcuate scale mounted to the first element, said scale extending over an angular range of less than 360°;
an arcuate housing substantially enclosing the scale, said housing defining an arcuate slit extending along the housing;
a pair of sealing elements, one disposed on either side of the slit to substantially seal the slit;
a scanning unit disposed to move within the housing adjacent the scale for measuring relative motion between the scanning unit and the scale; and
a blade shaped coupling member, coupled to the scanning unit, extending through the slit between the sealing members and mounted to the second element such that rotational movement between the first and second elements about the guide causes the scanning unit to move along the scale.

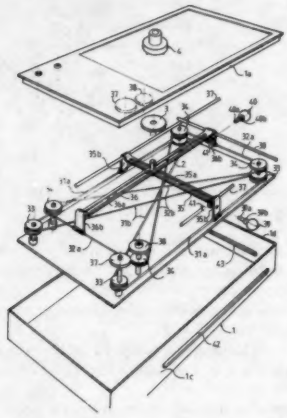
---

**4,369,579**

## DEVICE FOR DRAWING A PATTERN ON A SUPPORT, PARTICULARLY FOR USE AS A TOY

**Henri Mizoule, Versailles, France, assignor to William Gardel, Ville d'Avray, France**

**Filed Apr. 30, 1981, Ser. No. 258,907**
**Claims priority, application France, May 5, 1980, 80 09998**
**Int. Cl.³ G01D *15/00***
**U.S. Cl. 33—1 M** **10 Claims**



1. Device for drawing a pattern or design on a support, comprising a pencil holder fast with a magnetic piece sliding on a plate and moved, through said plate, by a first magnet, characterized in that said device comprises:
a box, generally parallelepipedic in form, with an upper wall composed of non-magnetic material,
in this box: a carriage movable along the X- and Y-axes relatively to the plane of the upper wall of the box,
control means for displacing the carriage along the X- and Y-axes,
a first magnet mounted on the carriage, one of its magnetic poles, called first pole, facing the upper wall of the box,
a pencil-holder adapted to rest on the outer face of said upper wall of the box, this pencil-holder comprising:
(a) a guide for receiving and holding at least laterally a pencil with the axis thereof not parallel to the plane of said upper wall and with the active tip of the pencil in contact with a drawing support resting on the upper wall of the box, (b) a second ring magnet adapted to cooperate with the first magnet, its pole opposite that of said first pole facing downwards, the opening of the second magnet being placed opposite the guide so as to surround the end of the pencil, and (c) at least one sliding member by which the pencil holder is adapted to slide on said drawing support.

---

**4,369,580**

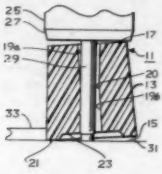
## DRAFTING PEN ACCESSORY

**Richard C. Pruitt, 6509 Ellis Rd., Fort Worth, Tex. 76112**

**Filed Apr. 18, 1980, Ser. No. 141,582**
**Int. Cl.³ B43L *13/00***
**U.S. Cl. 33—42** **7 Claims**

1. A device for drawing parallel, curved ink lines with a template comprising in combination:
a drafting pen of the type having a tubular tip depending downwardly from a collar;

a guide having an axial passage for receiving the tip, an outer surface concentric with the passage for rolling contact with the edge of the template, a top and a bottom, the axial passage being larger in diameter than the tip to allow the guide to tilt as the guide is pressed against the template to avoid contact of the bottom with the ink while wet;




the height of the guide being selected so that the top will be in sliding contact with the collar to limit the amount of tilt as the guide is moved about the template;

the portion of the outer surface that contacts the template being a frustum of a cone, being larger at the bottom than at the top.

---

**4,369,581**

## METHOD AND APPARATUS FOR THE DETERMINATION OF THE AXIS OF ROTATION OF A CIRCULAR TABLE IN MULTIPLE COORDINATE MEASURING INSTRUMENTS

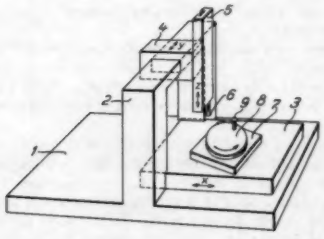
**Karl J. Lenz, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Postfach, Fed. Rep. of Germany**

**Filed Oct. 3, 1980, Ser. No. 193,717**

**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940633**

**Int. Cl.³ G01B 5/25**

**U.S. Cl. 33—169 C** **15 Claims**




1. A method for determining the axis of rotation of a rotatable table in a multiple coordinate measuring instrument equipped with at least one tracer, comprising the steps of:

arranging a spatial contact surface excentrically to the axis of rotation of the rotatable table;

determining the position of a point associated with the contact surface, in the coordinate system of the multiple coordinate measuring instrument by contacting the contact surface with the tracer;

repeating the determination of the position of said point in at least two additional different angular positions of the rotatable table;

determining the direction of the normal to a plane which contains the points determined in the at least three angular positions of the rotatable table; and

determining the center of a circle passing through the at least three points, whereby the axis of rotation of the rotatable table is the normal passing through the center of the circle.



**4,369,582**

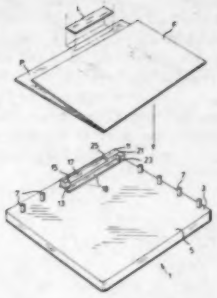
## MANUAL LABEL APPLYING TEMPLATE

**George B. Pfeffer, Minnetonka, Minn., assignor to Datafile Limited, Willowdale, Canada**

**Continuation-in-part of Ser. No. 205,168, Nov. 12, 1980, abandoned. This application Oct. 30, 1981, Ser. No. 316,346**

**Int. Cl.³ G01B 5/00**

**U.S. Cl. 33—180 R** **27 Claims**



1. Guide means adapted to guide accurate manual application of an adhesive member at an edge of a file panel, said guide means comprising a panel edge guide, an adhesive member guide raised relative to the panel edge guide and an adhesive member seat at generally right angles to and between the panel edge guide and adhesive member guide, said adhesive member seat being adapted to seat a first part of the adhesive member with the arrangement being such that when the panel edge is fitted along said panel edge guide, and the first part of the adhesive member is seated on the adhesive member seat with an edge of the first part of the adhesive member fitted along the adhesive member guide, a second part of the adhesive member overhangs the adhesive member seat where it is exposed for application to the file panel thereby locating the adhesive member in position on the panel, said adhesive member seat having low affinity for the adhesive member and being adapted to readily release the first part of the adhesive member to enable completion of the manual application of the adhesive member at the file panel edge.

2. A template adapted to guide accurate manual application of an adhesive label around an edge of a file panel from one side of the panel to an opposing side of the panel, said template comprising a label jig, a file panel supporting portion, and guide means for positioning the file panel on the file panel supporting portion with the file panel edge at the label jig, said label jig having a steplike construction and comprising a first riser, a second riser raised relative to said first riser and a generally horizontal tread portion which extends between said risers from the upper end of said first riser to the base of said second riser, the arrangement being such that said second riser is adapted to receive an edge of the label with the label being partially seated on said tread portion such that part of the label overhangs said first riser, where it is exposed for application to the one side of the file panel, thereby locating the label in position on the panel, said tread portion having low affinity for the adhesive label, so that it is adaped to readily release the seated part of the label to enable wrapping of the label around the panel edge and application of the released parat of the label to the opposing side of the panel.

11. A template adapted to guide accurate manual application of an adhesive member at an edge of a file panel, said template comprising a file panel supporting portion for supporting the file panel and guide means for fitting into said file panel supporting portion, said file panel supporting portion having a receiving region for said guide means which comprises at least one jig segment moveable to different guiding positions in said receiving region and means for locking said at least one jig

segment at the different guiding positions, said at least one jig segment having a step-like structure comprising a panel edge guide, an adhesive member guide generally parallel and raised relative to said panel edge guide and a seat portion between said panel edge guide and said adhesive member guide, said jig segment being arranged such that when the edge of the file panel is fitted along said adhesive member guide a first part of the adhesive member is seated on said seat portion and a second part of the adhesive member extends beyond the seat portion overhanging said panel edge guide of said jig segment where the second part of the adhesive member is exposed for adhering to the file panel located therebeneath, to initiate application of the adhesive member, said seat portion of said jig segment having low affinity to adhesive and being adapted to readily release the first part of the adhesive member for adhering to the file panel to complete the accurate manual application of the adhesive member at the file panel edge.

---

**4,369,583**

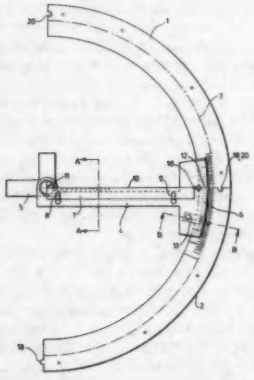
## PLOTTING DEVICE

**Sidney G. Brighty, Nova Guest House, 76 Nova Rd., West Croydon, Surrey, England**

**Continuation of Ser. No. 83,780, Oct. 11, 1979, abandoned. This application Jan. 8, 1982, Ser. No. 338,193**

**Int. Cl.³ B43L *7/00***

**U.S. Cl. 33—403** **8 Claims**



1. A plotting device for plotting points on a drawing surface comprising:

(a) a central island member adapted for mounting on said drawing surface over a pre-selected point,

(b) a peripheral protractor having an arcuate inner edge defining at least part of a circle and adapted to be mounted on said drawing surface at a selected position with respect to said island member so that said island member is the center of said circle, said protractor having an angular scale thereon,

(c) a radius arm having an inner end and an outer end,

(d) means operably connected to an outer end of said radial arm for locating said selected position,

(e) second means removably and pivotally securing said inner end to said island member,

(f) a vernier angular scale at the outer end of said arm coacting with said angular scale, and

(g) a longitudinal distance scale on said arm between said inner end and said outer end.

**4,369,584**

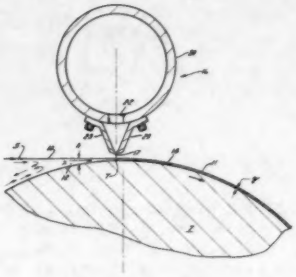
## PREVENTING AIR FILM BETWEEN WEB AND ROLLER

**Robert A. Daane, Green Bay, Wis., assignor to W. R. Grace & Co., New York, N.Y.**

**Filed Apr. 16, 1981, Ser. No. 254,989**

**Int. Cl.³ F26B *5/00***

**U.S. Cl. 34—12** **7 Claims**



1. In apparatus wherein a web is confined to lengthwise motion in one direction along a defined path and wherein said path has one portion in which the web extends substantially straight and has another portion which begins at the termination of said one portion and in which the web is curved in partial wrapping engagement with a cylindrical surface of a roller that rotates to have the peripheral speed of its said surface match the speed of lengthwise motion of the web, means for substantially preventing the intrusion of an air film between the roller and the web to ensure intimate contact between them, said means comprising:

A. an air nozzle at the side of the web opposite said roller, having an elongated and narrow outlet that opens towards the web, the outlet of said nozzle

(1) having its length extending transversely to the the length of the web, substantially across the full width of the web,

(2) having a width substantially less than 0.1 inch (2.5 mm),

(3) being located within a small distance in said direction of web motion from the termination of said one portion of said path, and

(4) being spaced from said surface of the roller by a distance not substantially greater than is sufficient to accommodate the thickness of the web between the nozzle and said surface of the roller and to permit air to issue from said outlet as a stream that impacts the web in a zone having very small extension in said direction; and

B. means for conducting pressurized air to said nozzle to issue from said outlet.

---

**4,369,585**

## WET AND DRY ROASTING APPARATUS AND PROCESS FOR NUT, BEAN AND SEED-LIKE PRODUCT

**William Berkoff, 6143 W. Olympic Blvd., Los Angeles, Calif. 90048, and Walter O. Martens, Los Angeles, Calif., assignors to William Berkoff, Los Angeles, Calif.**

**Filed Dec. 8, 1980, Ser. No. 214,184**

**Int. Cl.³ F26B *11/04***

**U.S. Cl. 34—63** **10 Claims**

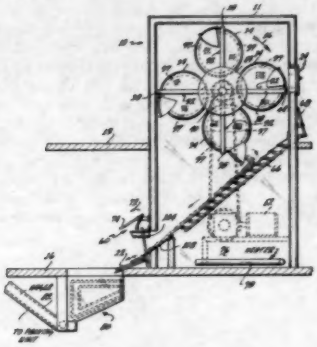
1. Container means for holding a quantity of nut, bean and seed-like product while said product is roasted by heated air at roasting temperatures, comprising:

a. a plurality of containers having perforations for draining treated and untreated liquids from said product and for allowing said air at said roasting temperatures to pass through, but capable of holding a quantity of said product,

each said container being rotatable about a center of rotation and being substantially cylindrical and having a generally horizontal axis;

b. container moving means for interconnecting said containers and for providing translational movement of said container through the heated air thereabout; and

c. a container discharge means for discharging the product



including; a hinged door comprising part of the surface area along substantially the length of said containers, and comprising latch means for securing each of said doors shut, each of said doors being openable by gravity when said latch means is unsecured and said container is rotated to a position where the door occupies the lower portion of the cylindrical container so as to allow said product to evacuate.

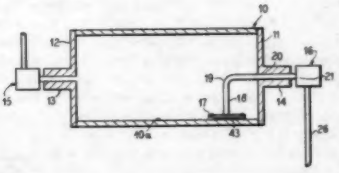
---

**4,369,586**

## DRYER SIPHON

**Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Apr. 20, 1981, Ser. No. 255,844**
**Int. Cl.³ F26B *13/08***
**U.S. Cl. 34—125** **10 Claims**



1. A paper machine dryer mechanism comprising in combination:

a rotary annular hollow cylindrical dryer drum shell having a smooth inner surface and having means for delivering steam to the interior for heating the outer surface of the drum to dry a paper web in contact with the outer surface;

a condensate siphon conduit means leading from the interior of the drum to the exterior for removing condensate forming on the inner surface of the shell;

and a siphon shoe connected to the inlet end of the conduit means for receiving condensate from the inner surface of the shell, said shoe having an elongate planar leading face extending axially and tapered toward the inner surface of the shell with said tapered face defining a condensate receiving gap between said edge and said shell inner surface with said gap being of uniform radial depth in an axial direction across the shell, said shoe having an elongate planar trailing face tapered toward the inner surface of the shell and having a trailing condensate delivery gap with said trailing gap being of uniform radial depth in an axial direction across the shell, said shoe having an inner axially elongate chamber between said planar faces for receiving the flow of condensate with the chamber communicating with the siphon conduit means and with each of said leading and trailing gaps.

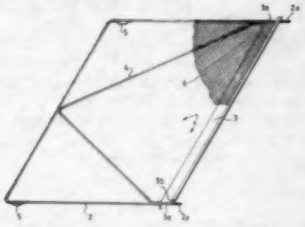
---

**4,369,587**

## DRIER FOR SCREEN PRINTED SHEETS

**Bernard David, 20, rue de Rambervilliers, 75012 Paris, France**

**Continuation-in-part of Ser. No. 51,414, Jun. 25, 1979, abandoned. This application Oct. 23, 1980, Ser. No. 199,917**
**Int. Cl.³ F26B *15/14***
**U.S. Cl. 34—150** **10 Claims**



1. A drier for sheets printed by serigraphy, comprising a chassis formed as a duct; an endless conveyor supplied by said chassis; a plurality of sheet-receiving trays hingedly connected with said conveyor and each having a frame and a solid air-tight sheet support mounted on said frame, said frame of each of said trays having one side which is adjacent to said conveyor and is hingedly connected with the latter; a deflector edge fixed to said one side of said frame of each of said trays; a plurality of nippers placed on said deflector edge at said one side of said frame of each of said trays; means for hingedly connecting said trays to said conveyor and being connected with said one side of said frame of each of said trays and with said conveyor; an air-blowing device connected with said duct-forming chassis, so that a current of air blown by said air-blowing device is directed by said duct-forming chassis to a bottom of each of said trays and then travels between said trays; means for immobilizing said trays in a predetermined position; means for correcting a position of said trays; cooperating means which cooperate with said immobilizing and correcting means for alternately releasing the same from said tray and replacing them in a path of said trays; means for rotating said conveyor with said trays; and a micro-contact placed in the path of said trays and arranged so that it interrupts the operation of said means for rotating said conveyor and actuates said cooperating means for correcting a next one of said trays so as to put the same exactly to a position where a wet sheet is to be placed.

---

**4,369,588**

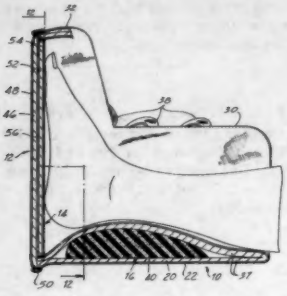
## ISOTHERMIC PROTECTIVE BOOT

**Ramon Berguer, West Bloomfield, Mich., assignor to Lunax Corporation, West Bloomfield, Mich.**

**Filed Jan. 22, 1981, Ser. No. 227,367**
**Int. Cl.³ A43B *1/02, 1/10, 7/14***
**U.S. Cl. 36—9 R** **18 Claims**

1. An isothermic protective boot having a foot-receiving part and a contiguous leg-receiving part adapted to extend up to at least the lower portion of the calf of a patient, said boot having a complete inner lining of relatively soft, non-allergenic material, said boot also having a layer of relatively soft, flexible, compressible isothermic protective material throughout

the full extent of both its parts and a body of weight-bearing material along at least a portion of the back of said leg-receiving part in a position to extend along the heel cord of the



wearer such that when the wearer is lying on his back the weight-bearing surface of the extremity of the wearer will be over the heel cord and lower aspect of the calf and not the bottom of the heel.

---

**4,369,589**

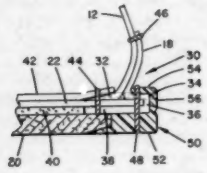
**SHOES**

**Walter R. Summey, 18014 Granada Ave., Fontana, Calif. 92335**

**Filed Jul. 7, 1980, Ser. No. 166,352**

**Int. Cl.³ A43C *13/14*; A43B *5/00***

**U.S. Cl. 36—77 R** **15 Claims**



1. In a shoe of the type that has an interconnected upper, midsole, and sole and in which the midsole and sole extend beyond the upper in the region of the toe of the shoe, the improvement which comprises the addition of a wrap-around member in the region of the shoe's toe in the form of an element which is fastened to the upper at a point above its junction with the midsole and which extends over and under the midsole to a position between the midsole and the main sole; and

said wrap-around member extending over, around and under the outer margin of said midsole and being fastened to both the upper and the lower faces of said midsole.

---

**4,369,590**

**REAR MOUNTED SCRAPER FOR VEHICLES**

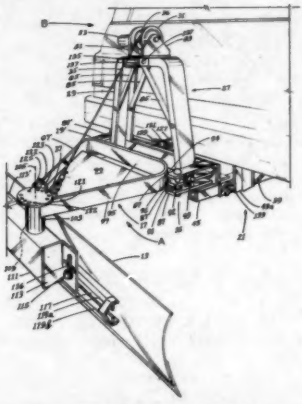
**Michael E. Miller, 204 W. Church St., Savoy, Ill. 61874**

**Filed Dec. 3, 1980, Ser. No. 212,360**

**Int. Cl.³ E01H *5/06***

**U.S. Cl. 37—231** **4 Claims**

1. In combination, self-contained scraper apparatus for quick attachment to, and detachment from, the rear of a light truck vehicle or the like, and attachment means suspended from the frame of said vehicle, the entirety of said attachment means being positioned at a level substantially at or below the bumper level of said vehicle characterized by said scraper apparatus comprising a securement frame having a pair of laterally spaced forwardly projecting telescoping frame members, said attachment means including an attachment frame mounted to the chassis of said vehicle at the rear thereof and having a pair of socket-defining recesses at opposite sides of said vehicle for telescopingly receiving corresponding ones of said telescoping frame members, means for securing said telescoping frame members in the respective socket-defining members, said scraper apparatus being thereby attachable to and carryable by said vehicle solely by telescoping frame members being received in said socket-defining members, a scraper blade, a blade-carrying frame, means for pivotally connecting said scraper blade to said blade-carrying frame, means providing pivotal interengagement of said blade-carrying frame to said securement frame to permit rotation of said blade-carrying frame about a transverse pivot axis, an electric winch carried by said securement frame, a winch cable extending from said electric winch to a transverse pivot axis-remote location on said blade-carrying frame, said winch being energizable in response to voltage supplied by said vehicle, whereby said winch effects raising of said blade-carrying frame by rotation about said transverse pivot axis under operator remote control,



said means for pivotally connecting said blade to said blade-carrying frame including a sleeve carried by said blade-carrying frame at a location remote from said transverse pivot axis, a shaft secured to said blade and rotatable in said sleeve, and means for locking said shaft relative to said sleeve for permitting a preselected angular relationship between said blade and the longitudinal axis of said vehicle, said blade being pivotable by rotation of said shaft between forward facing and rearward facing orientations, said blade-carrying frame when raised by said winch pivoting upon said transverse pivot axis to raise said blade out of contact with the surface upon which said vehicle stands, and to a position proximate the rear of said vehicle, and when lowered by said winch permitting said blade to contact said surface with said blade-carrying frame extending rearwardly from said securement frame and from said vehicle with said blade having either forwardly or rearwardly facing orientation, whereby said scraper apparatus may be either quickly attached to or detached from said attachment by telescoping movement of said telescoping frame means members relative to said socket-defining members.

---

**4,369,591**

**INFLATABLE DISPLAY STRUCTURE**

**Robert K. Vicino, 8847 Complex Dr., San Diego, Calif. 92123**

**Filed Jun. 3, 1981, Ser. No. 270,082**

**Int. Cl.³ G09F *15/00***

**U.S. Cl. 40—610** **12 Claims**

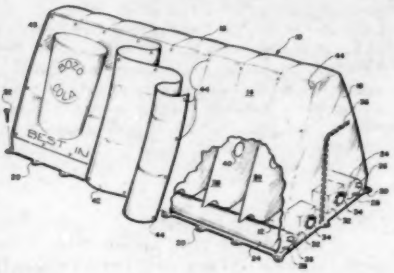
1. An inflatable billboard comprising:

(a) a body having an inflatable flexible skin defining an enclosure;

(b) said body defining a base panel to rest on an underlying surface

(c) anchor means for securing said body in place with said base panel secured to the underlying surface;

(d) a portion of said skin defining a side panel oriented to be generally upright when said base panel is anchored;



(e) a plurality of gussets within said enclosure, said gussets being fastened to said skin to hold said side panel substantially flat when said skin is inflated; and

(f) means securing a display on said side panel, whereby said inflatable billboard can be anchored on location and inflated for use as a display, or deflated into a compact form for shipment and storage.

---

**4,369,592**

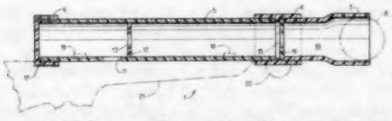
**PROPELLING METHOD AND DEVICE**

**J. E. Perry, P.O. Box 483, Murrells Inlet, S.C. 29576**

**Filed Nov. 19, 1980, Ser. No. 208,147**

**Int. Cl.³ F41C *3/06***

**U.S. Cl. 42—54** **16 Claims**



1. A method, for propelling an object from a device comprising a loading chamber, a loading mechanism, and a firing chamber portion with an open end, comprising:

a. placing said object in said open end of said firing chamber portion;

b. positioning an explosive device with a fuse within said loading mechanism, with said loading mechanism secured within said loading chamber of said device;

c. igniting said fuse of said explosive device;

d. injecting the portion of said loading mechanism holding said explosive device with said fuse, which has been ignited, into said firing chamber portion of said device; and

e. dropping said explosive device with said fuse which has been ignited from said loading mechanism into said firing chamber portion,

whereby said explosive device explodes propelling said object from said device.

**4,369,593**

**FIRING MECHANISM FOR PISTOLS**

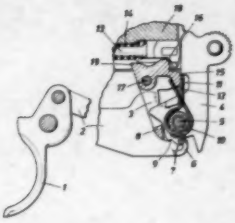
**Ulrich Zedrosser, and Satish K. Malhotra, both of Steyr, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria**

**Filed Feb. 17, 1981, Ser. No. 235,073**

**Claims priority, application Austria, Mar. 10, 1980, 1304/80**

**Int. Cl.³ F41C *17/04***

**U.S. Cl. 42—70 F** **6 Claims**



1. In a firing mechanism for a pistol, comprising

a pivoted hammer, which is pivotally movable in a cocking sense from an uncocked position to a cocked position and in a striking sense from said cocked position to said uncocked position,

a hammer spring urging said hammer in said striking sense,

a firing pin which is axially movable between a retracted position and a firing position, said hammer when urged by said spring from said cocked position to said uncocked position being arranged to strike on said firing pin when it is in said retracted position and to cause said firing pin to move to said firing position, and

a catch lever, which is pivotally movable between a position of rest and an actuated position and when in said actuated position is arranged to engage said hammer in said cocked position so as to hold said hammer in said cocked position, said catch lever being adapted to release said hammer for a movement in said striking sense,

the improvement residing in that

said catch lever has first and second locking surfaces,

said first locking surface is arranged to engage said hammer and to prevent a movement of said hammer in said striking sense when said hammer is in said uncocked position and said catch lever is in said position of rest, and

said second locking surface is arranged to engage said firing pin and to prevent a movement of said firing pin toward said firing position when said hammer is in said uncocked position, said firing pin is in said retracted position, and said catch lever is in said position of rest.

---

**4,369,594**

**MAGAZINE FOR MUZZLE LOADER**

**Joe F. Zurga, Rte. 8, Box 44, Harrison, Ark. 72601**

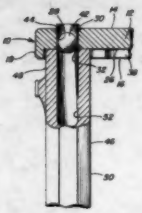
**Filed Oct. 21, 1980, Ser. No. 199,302**

**Int. Cl.³ F41C *27/00***

**U.S. Cl. 42—90** **7 Claims**

1. A muzzle loading device for a muzzle loader gun, said device including a body having a top face, a bottom face and a vertical dimension, a downwardly opening recess formed in said bottom face, a plurality of laterally spaced upstanding and cylindrical shot bores formed in said body opening upwardly through said top face and downwardly into said recess spaced from the periphery thereof, a plurality of patch embraced slot balls frictionally wedged in said shot bores and displaceable axially therethrough, the lower portions of said shot balls and the embracing portions of said patches projecting at least significantly downwardly into said recess, those portions of said patch embraced shot balls projecting downwardly into said recess serving as locaters for and being losely receivable in the muzzle end of a gun barrel bore whose muzzle is displaced

upwardly into said recess and thereby aligning said barrel bore with a shot bore and the patch embraced shot ball disposed



therein for projection of said patch embraced shot ball from the lower end of the corresponding shot bore directly into the barrel bore.

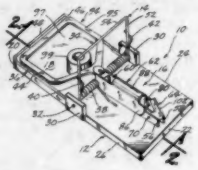
---

**4,369,595**

## ANIMAL TRAP

**Lester E. Kness, Granger; Marvin E. Kness, and Arnold A. Kness, both of Albia, all of Iowa, assignors to Kness Manufacturing Co., Inc., Albia, Iowa**

**Continuation-in-part of Ser. No. 149,188, May 12, 1980, Pat. No. 4,297,805. This application Nov. 3, 1980, Ser. No. 203,311**
**The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.**
**Int. Cl.³ A01M *23/30***
**U.S. Cl. 43—83.5** **10 Claims**



1. An animal trap comprising:

a base having an upper surface, opposite sides and opposite ends;

a bait receiving means fixed to said upper surface of said base;

a jaw member pivotally mounted on said base for pivotal movement about a first horizontal axis from a cocked position to a sprung position, said jaw member having at least one horizontal bar extending transversely of said base and being movable in an arc during said pivotal movement of said jaw member,

spring means yieldably urging said jaw member to said sprung position,

a catch member pivotally mounted to said base for pivotal movement about a second horizontal axis, said catch member having a catch pawl thereon for retentively engaging said bar when said jaw member is in said cocked position,

said catch member being pivotal about said second horizontal axis from a catch position wherein said catch pawl retentively engages said bar in said cocked position to a release position wherein said catch pawl moves out of retentive engagement with said bar,

a trip member pivotally mounted on said base for pivotal movement about a third horizontal axis, said trip member having a catch receiving surface, said trip member being pivotal about said axis from a set position wherein said catch receiving surface engages said catch and holds said catch against movement from said catch position, said trip member being pivotal to a trip position wherein said catch receiving surface frees said catch member for movement to said release position, thereby freeing said jaw member for movement to said sprung position,

said trip member having a perimetric edge surrounding and defining an opening therein, said opening being located above said bait receiving means; and

a reset member movably mounted to said base and including a foot at one end thereof and a reset cam, said reset cam being engageable with said bar of said jaw member during movement of said jaw member to said cocked position, said reset member being movable in response to engagement between said bar and said reset cam so as to cause said foot to engage said trip member and move said trip member from said set position to said trip position whereby said catch member will fall by gravity to said release position.

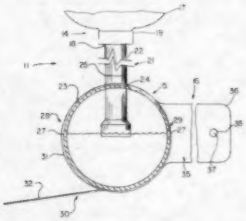
---

**4,369,596**

## LIQUID APPLYING APPARATUS

**Thomas D. Hartford, 4221 Lewis Ave., Great Falls, Mont. 59405**

**Continuation-in-part of Ser. No. 109,804, Feb. 6, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,885**
**Int. Cl.³ A01M *21/00***
**U.S. Cl. 47—1.5** **10 Claims**



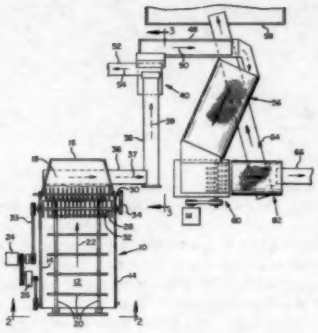
1. Liquid applying apparatus mountable on a lawnmower, said apparatus including a liquid storing portion, a liquid distributing portion and a mounting portion; said liquid storing portion including a substantially airtight chamber, an opening adjacent the bottom of said storing chamber, conduit means extending downwardly from said storing chamber opening to said liquid distributing portion; said liquid distributing portion including a substantially horizontal distribution chamber, said distribution chamber having a length substantially greater than the cross section thereof, said distribution chamber including an inlet opening adjacent the top thereof, said inlet opening being connectable with said conduit means, a plurality of spaced outlet openings in said distribution chamber, said outlet openings being arranged along at least one substantially horizontal line disposed longitudinally of said distribution chamber and located intermediate the top and bottom of said chamber, said conduit means extending through said inlet opening of said distribution chamber to a point adjacent said horizontal line of openings in said chamber, textile material associated with said distribution chamber, said textile material being disposed with one section wrapped around the periphery of said distribution chamber and the opposite end section extending from said wrapped section a distance greater than the diameter of said distribution chamber; said mounting portion including at least one bracket means having one end affixible to said distribution chamber, said bracket means including a connector section extending from said distribution chamber, fastening means disposed adjacent the free end of said connector section, said fastening means being connectable to a lawnmower housing, support means extending upwardly from said connector section capable of supporting said liquid storing portion above said distribution chamber.

4,369,597

## PELLETIZED MINT MULCH AND METHOD OF MAKING

Ronald B. Leep, P.O. Box D, Madras, Oreg. 97741, and Stanley A. Kaber, Culver, Oreg., assignors to Ronald B. Leep, Madras, Oreg.

Filed Mar. 24, 1981, Ser. No. 247,169
Int. Cl.³ A01G 1/00
U.S. Cl. 47—9 17 Claims



1. A method of making mint mulch for use in mulching the surface of bare soil to encourage the growth of ground cover thereon, the method comprising:

drying mint slugs to a moisture content of about 15% to 20%;

chopping the dried mint slugs to a fiber length of less than about one inch; and

pelletizing the dried, chopped mint slugs to produce mint mulch pellets.

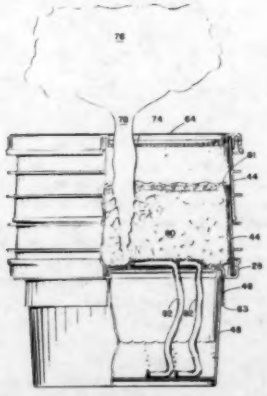
---

4,369,598

## CONTAINER ELEMENT COMBINATION FOR SEED SPROUTING OR PLANT CULTURE

Thomas F. Beckwith, 223-14th Ave. East, Apt. 1, Seattle, Wash. 98112

Filed Mar. 19, 1981, Ser. No. 245,327
Int. Cl.³ A01G 9/02
U.S. Cl. 47—66 13 Claims



1. A method of making a multiple use container, adapted for growing plants, sprouting seeds or the, like, from utility pails and mateing lids comprising the steps of:

(a) selecting a circular utility bucket of the type having tapered side walls and an enclosing bottom;

(b) selecting a lid which has a circumferential, circular groove on its bottom surface mateable with the top edge of the bucket and a circumferential, circular groove on its top of a smaller diameter than that on its bottom surface;

(c) cutting the bucket on a transverse plane to form a ring structure to which the lid may be attached and the entire ring and lid inverted and to form an open top container whose top will receivably engage the groove in the top of the lid which when inverted forms a lid for the open top container.

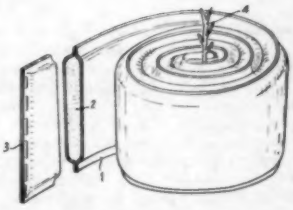
---

4,369,599

## CULTIVATION BALLS

Andre Franclet, Donnemarie, and Pierre Favereau, Echouboulains, both of France, assignors to Association Foret-Cellulose, Paris, France

Continuation of Ser. No. 5,230, Jan. 22, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,501
Claims priority, application France, Feb. 9, 1978, 78 03708
Int. Cl.³ A01G 9/02
U.S. Cl. 47—74 6 Claims

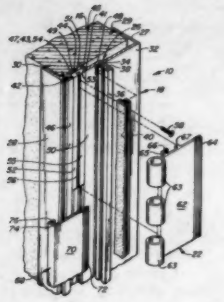


1. A plant cultivation ball comprising at least one envelope in the form of a flattened elongated tube having an inner wall and an outer wall, a powdery cultivation substrate within the tube, means closing each end of the tube to prevent escape of the cultivation substrate from the tube, said tube being wound around the plant and around itself to form a ball of at least one convolution within which the plant is separated from said substrate by at least one wall of said envelope, said inner wall of said tube comprising a first sheet, and said outer wall of said tube comprising a second sheet, said sheets being joined together along their longitudinal edges, said sheets forming said walls of said envelope each comprising a material through which the roots of the plant can pass once the ball has been set to grow and said tube being devoid of any attached root impermeable covering so that the roots of a plant within the ball can pass freely through the ball into the medium in which the plant is set to grow.

## 4,369,600
## DOOR FRAME ASSEMBLY WITH IMPROVED CHARACTERISTICS

Alexander E. Passovoy, 241 Village Gate Rd., Orinda, Calif. 94563

Filed May 14, 1981, Ser. No. 263,534
Int. Cl.³ E06B 1/04
U.S. Cl. 49—504 12 Claims



1. Apparatus for constructing a door frame in an opening formed in a wall to accommodate a door, said apparatus comprising:

a frame member including a central web adapted to span the width of the wall and a pair of side flanges extending from the lateral edges of the web and adapted to fit over the edges of the wall circumscribing the opening, said web including a pair of grooves opening in a common transverse direction, one said groove located proximate the center of said web and the other said groove located proximate one lateral edge of the web, the web further including a longitudinally-extending recess between said grooves;

at least two hinge members each having a hinge plate which includes a set of elongate tongues adapted to engage and mate with the respective grooves in the frame member and a separate elongate tongue projecting normal to the remaining tongues into the recess of the frame member;

at least two bars slidable in the recess of the frame member, said bars each defining a longitudinally-extending slot on the outer surface thereof to engage the separate elongate tongue of the respective hinge member when the bars are moved into position beneath the hinge members; and

a plurality of cover plate sections each including a pair of elongate tongues adapted to engage and mate with the respective grooves in the frame member, said cover plate sections adapted to be cut to fit the gaps between hinge plates and the ends of the frame member so that the space between the hinge plates is covered, to provide a sturdy, aesthetically pleasing door frame.

---

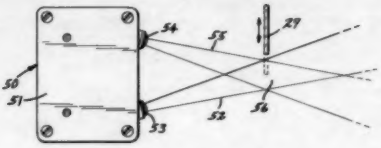
## 4,369,601
## APPARATUS FOR TRACKING BELT FOR ABRASIVE GRINDING MACHINE

Dennis J. Gerber, Minneapolis, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed Jan. 27, 1981, Ser. No. 228,946
Int. Cl.³ B24B 21/18
U.S. Cl. 51—135 BT 14 Claims

1. An abrasive grinding machine including a grinding head having an endless abrasive belt movably carried by at least two spaced rollers to define at least two spaced flights, drive means for driving one of the rollers and tracking means operative in first and second modes for respectively causing the abrasive belt to move laterally back and forth over the rollers, the improvement which comprises:

(a) photodetector means comprising a radiation source generating a beam of radiated energy and a detector having a radiation detecting view field, means mounting the source and detector so that the radiation beam and view field intersect in a predetermined region, and so that said source and detector are protectively disposed between said flights and arranged so that said predetermined region is traversed by only one edge of the abrasive belt;



(b) said photodetector means generating a first signal upon entry of said one edge of the abrasive belt into the predetermined region, and a second signal upon said one edge of the abrasive belt leaving said predetermined region;

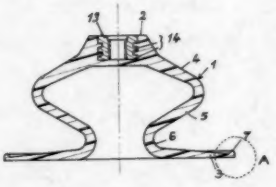
(c) and control means operatively connected to the photodetector means for causing the tracking means to operate in one of said first and second modes in response to said first signal and for operating in the other of said first and second modes in response to said second signal.

---

## 4,369,602
## SURFACE FINISHING DEVICE

Charles G. Amicel, Carrieres-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed Dec. 10, 1980, Ser. No. 214,996
Claims priority, application France, Jun. 18, 1980, 80 13484
Int. Cl.³ B24B 41/00
U.S. Cl. 51—168 3 Claims



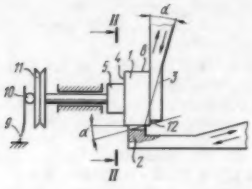
1. In combination with a drive shaft and a surface finishing accessory, a device for transmitting to said surface finishing accessory the rotary motion provided from said drive shaft through a single-piece mechanical transmission consisting solely and exclusively in a generally bell-shaped resilient intermediate member having at the input end thereof a flared central vertex couplable to said drive shaft and at the output end thereof a flared peripheral base fittable to said surface finishing accessory, wherein the improvement comprises, between said flared central vertex and said flared peripheral base, an intermediate tapering portion forming a single annular constrictive indentation in the outer surface of said single-piece transmission, whereby the latter is bestowed with universal deformation capacity about its axis of rotation, said surface finishing accessory bearing base being displaceable longitudinally along, laterally from and angularly about said axis.

**4,369,603**

## METHOD OF POSITIONING AND ROTATING WORKPIECE AND ARRANGEMENT IMPLEMENTING SAME

**Iosif D. Gebel, Svetlanovsky prospekt, 35, kv. 94; Arkady A. Zykov, prospekt Smirnova, 15, kv. 51; Vladimir M. Lvov, Manchesterskaya, 16, kv. 58; Askold I. Nefedov, 2 Nikitinskaya ulitsa, 8, kv. 5; Viktor I. Parshikov, prospekt K. Marxa, 70, kv. 93; Marina Y. Starkina, prospekt Shvernika, 3, kv. 121; Mendel S. Klibanov, all of Leningrad, U.S.S.R.; Alexandr S. Ryss, deceased, late of Leningrad, U.S.S.R., and by Maria I. Ryss, legal representative, ulitsa Vavilovykh, 15, korpus 3, kv. 85, Leningrad, U.S.S.R.**

**Continuation of Ser. No. 965,036, Nov. 30, 1978, abandoned.**
**This application Jun. 30, 1980, Ser. No. 164,150**
**Int. Cl.³ B24B *41/06***
**U.S. Cl. 51—236** **22 Claims**



1. A method for positioning and rotating a workpiece shaped like a body of rotation, the method being used during workpiece machining and controlling dimensions and shape of the workpiece, the method comprising the following steps:

positioning said workpiece on a support system comprising an axial support and a radial support, thus ensuring the respective lines of contact between said workpiece and said supports;

engaging a surface of said workpiece with a rotary driving member;

bringing said workpiece into rotation by torque transmitted from said rotary driving member to said workpiece due to the forces of friction developed therebetween;

feeding independent ultrasonic mechanical vibrations to each of said supports of said support system in a direction parallel to or at an angle not exceeding 10 degrees with the line of contact between said workpiece and respective ones of said supports;

whereby the frictional interaction between said driving member and said workpiece is maintained substantially without interference from said ultrasonic mechanical vibrations, while the forms of friction developed between said workpiece and said support system are significantly reduced due to said ultrasonic mechanical vibrations fed thereto.

---

**4,369,604**

## METHOD FOR MECHANICALLY PREPARING STYLUS LAPPING DISCS

**Grzegorz Kaganowicz, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.**

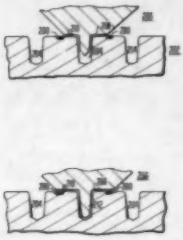
**Filed Feb. 27, 1981, Ser. No. 238,805**
**Int. Cl.³ B24B *1/00*; G11B *3/00***
**U.S. Cl. 51—281 R** **6 Claims**

1. A method for preparing a groove having a given depth for use in lapping a keel on a playback stylus, said playback stylus being suitable for playing back prerecorded signals from a disc record groove of a given width, said keel being defined by a constricted terminal region on a tip of said playback stylus, said constricted terminal region being narrower than said given width and having a dimension along at least one face thereof which is substantially equal to said given depth, said method comprising the steps of:

mounting a metal substrate on a turntable;

establishing relative motion between a cutting stylus and said metal substrate;

introducing a cutting tip of said cutting stylus into a surface of said metal substrate during said relative motion for mechanically cutting a groove into said surface of said metal substrate, said cutting tip having a shape complementary to the shape of said keel of said playback stylus, said relative motion being established such that said



groove is formed in said substrate surface in a spiral pattern;

recording a signal on said surface of said metal substrate, said signal being provided for monitoring a playback stylus lapping process on a replica;

forming a metal part from said grooved metal substrate; and

stamping said replica from said metal part, said replica having a groove shape and size substantially similar to the shape and size of the groove cut into said metal substrate.

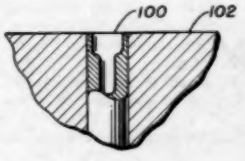
---

**4,369,605**

## METHODS FOR PREPARING TUBE SHEETS FOR PERMEATORS HAVING HOLLOW FIBER MEMBRANES

**Edward J. Opersteny, Chesterfield, Mo., and Alfred K. Fritzsche, Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Jul. 11, 1980, Ser. No. 168,937**
**Int. Cl.³ B24B *1/00***
**U.S. Cl. 51—319** **18 Claims**



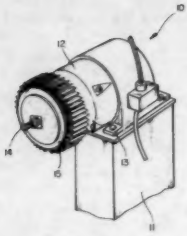

1. A method for opening the entrance to bores of hollow fiber membranes embedded in a solid potting material to form a tube sheet wherein the hollow fiber membranes terminate at at least one face of the tube sheet comprising externally blasting the surface of said at least one face of the tube sheet with a particulate abrasive having an average maximum cross-sectional dimension of less than about 70 percent of the minimum cross-sectional dimension of the bores of the hollow fiber membranes at a velocity sufficient to erode the surface of the hollow fiber membranes.

**4,369,606**

## ABRASIVE HEAD

**Ralph E. Reiman, Indianapolis, Ind., assignor to Grinding & Polishing Machinery Corp., Indianapolis, Ind.**

**Filed Sep. 11, 1980, Ser. No. 186,233**
**Int. Cl.³ B24D 9/06**
**U.S. Cl. 51—334** **11 Claims**



1. An abrasive head mountable on a rotatable spindle:
a first plate and a second plate spaced apart and parallel having a centrally located hole extending therethrough to receive a spindle rotatable on an axis of rotation;
a plurality of outwardly extending brushes spaced from each other around said axis and positioned between said first plate and second plate;
brush holders securing said brushes between said first plate and second plate, said holders having parallel but offset side mounting flanges with said flanges of each holder overlapping and secured to flanges of adjacent holders and to said first plate, said holders also each having a rear flange secured to said first plate;
a plurality of abrasive strips mounted within said head and including free distal ends extending outwardly therefrom between adjacent brushes;
first means mounted to said first plate and second plate holding said strips therebetween; and,
a plurality of clips, each extending between and secured to one of said side mounting flanges and a rear flange of said holders distributing force therebetween as said head is rotated exerting centrifugal force on said holders.

---

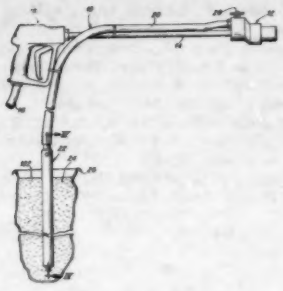
**4,369,607**

## SAND BLASTING APPARATUS

**William L. Bruggeman, Bethel, and Claude B. Myers, Brooklyn Park, both of Minn., assignors to Cat Pumps Corporation, Minneapolis, Minn.**

**Filed Jun. 18, 1980, Ser. No. 160,589**
**Int. Cl.³ B24B 5/04, 7/00**
**U.S. Cl. 51—427** **8 Claims**

6. In a blaster for jetting abrasive and water, the improvement of:
a discharge device with passage means formed in said discharge device,
said passage means comprising:
first and second parallel axial inlet passages,
an enlarged mixing zone communicating with said axial passages, and
a discharge opening passage parallel with said axial passages and communicating with said mixing zone,
said first axial passage being an abrasive passage and having a first parallel inlet leg in a second leg angled towards said mixing zone and having a wall susceptible to erosion by the flow of abrasive from said first leg to said second leg,



a controllable air inlet between said two legs which will admit air and form an air curtain over said wall of said second leg, thereby to protect said wall against erosion.

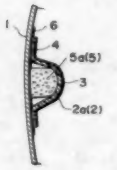
---

**4,369,608**

## PANEL FOR AUTOMOBILE

**Toshikatsu Miura, Higashikurume; Hiroto Kikuchi, Hiratsuka; Yukio Okada, Kodaira, and Tsutomu Yoshioka, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Sep. 3, 1980, Ser. No. 183,691**
**Claims priority, application Japan, Sep. 8, 1979, 54-114731**
**Int. Cl.³ B32B 7/08; B60R 13/04**
**U.S. Cl. 52—309.9** **4 Claims**




1. A panel for an automotive vehicle comprising:
an outer panel of the vehicle;
a rust-proofing film bonded to the inner side of said outer panel;
a main reinforcing member bonded at its periphery to the inner side of said film, said main reinforcing member being made of a hardened thermosetting resin;
an auxiliary reinforcing member bonded to and covering the entire inner side of said main reinforcing member; and
a core element completely encapsulated between the inner side of said film and the outer side of said main reinforcing member, said core element being made of a foamed resin material that is heat-expanded to cause said main reinforcing member and said auxiliary reinforcing member to bulge inwardly to form a rib-like projection to strengthen the panel.

---

**4,369,609**

## PREFABRICATED BUILDING SYSTEM

**Robert W. Sheldon, 560 Carriage Dr., NE., Atlanta, Ga. 30328, and Richard W. Mullin, Fox Ridge Rd., Eufaula, Ala. 36027**

**Filed Aug. 18, 1980, Ser. No. 178,953**
**Int. Cl.³ E04B 5/52**
**U.S. Cl. 52—478** **6 Claims**

1. A fastener assembly for use in attaching a plurality of

juxtaposed work pieces together where the work pieces have a prescribed total thickness at the point of attachment including:

a screw including a shank; an enlarged head at one end of said shank; a drill tip at the opposite end of said shank; and a self tapping thread around said shank, said self tapping thread having a leading end adjacent said drill tip and a trailing end spaced a prescribed distance from said head substantially equal to the prescribed total thickness of said work pieces, said drill tip adapted to drill holes through said work pieces sized to just receive said shank therethrough so that said self tapping thread will tap through said work pieces as said screw is rotated after said drill tip forms the holes to allow said head on said screw to move toward one side of said work pieces whereby said thread

successively releases the work pieces as said head moves toward the one side of the work pieces to cause the work pieces to be clamped together in the juxtaposed position as the trailing end of said thread threadedly passes through that work piece opposite said head and whereby said thread threadedly disengages said work pieces when said head is juxtaposed with the one side of said work pieces so that said screw is free to rotate with respect to said work pieces yet the trailing end of said thread maintains said work pieces clamped together; and

a locking member adapted to be threadedly engaged by said thread on said screw and screwed down against the work pieces opposite said head as said screw is rotated with respect to said work pieces to clamp said work pieces between said locking member and said head on said screw.

---

**4,369,610**

## EXTERNAL REVETMENT PANEL FOR BUILDINGS

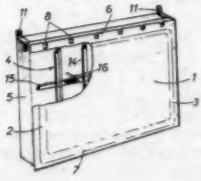
**Daniel Volan, Grisy les Platres, France, assignor to Luchaire S.A., Paris, France**

**Filed Dec. 9, 1980, Ser. No. 214,676**

**Claims priority, application France, Dec. 11, 1979, 79 30337**

**Int. Cl.³ E04B** *1/62, 2/00*

**U.S. Cl. 52—509** **12 Claims**



1. An external revetment panel for buildings and more particularly a ventilated insulating revetment panel comprising in succession from the exterior to the interior a shell having parallel ribs along its vertical edges, a screening panel and insulating material, said screening panel maintaining the insulating material in spaced relationship with the shell, in which:

the shell has an upper and a lower edges in parallel stepped relationship to the surface, the depth of the lower step being smaller than the depth of the upper step, the edge of the upper step being bent into a channel section and the transverse web of the channel section having holes formed therein,

gapping means provided on at least one of the stepped edges of the panel,

at least one bracket fixed to the free flange of the channel section, and

the insulating material fixed to spacing means which are in turn fixed to the internal surface of the shell.

---

**4,369,611**

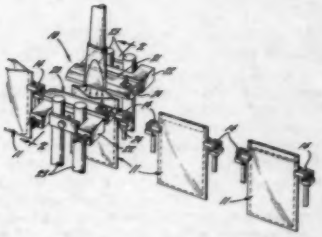
## TOP HEAT SEALING UNIT FOR POUCHES

**Allen B. Canfield, Sarasota, Fla., assignor to Rexham Corporation, New York, N.Y.**

**Filed Jul. 7, 1980, Ser. No. 166,072**

**Int. Cl.³ B65B** *51/14, 55/04*

**U.S. Cl. 53—127** **8 Claims**



1. A packaging machine having means for advancing upright pouches along an upright path, each of said pouches having an open upper end portion and being defined by two opposing upright side panels made of heat sealable material, each of said pouches receiving a product at a filling station positioned along said path, means downstream of said filling station for introducing steam into each filled pouch to drive air out of the pouch, a heat sealing unit for sealing the upper end portion of each pouch after steam has been introduced therein, said heat sealing unit comprising first and second elongated and generally horizontal opposing rigid bars adapted to close and apply heat and pressure upon the upper end portion of each pouch below the upper edge thereof, and means for heating at least one of said bars, said packaging machine being characterized in that said one bar has an active forward side defined by a set of upper and lower generally planar and inclined faces which converge into intersecting relation with one another upon progressing forwardly, the included angle of convergence between said faces being obtuse with the surface defined along the intersection of said faces forming the forwardmost extremity of said one bar and defining a sealing surface, said sealing surface engaging the upper end portion of one of said side panels when said rigid bars are closed to apply heat and pressure so as to form a narrow, single line-type seal along the upper end portion of the pouch only at the intersection of said rigid bar faces, said inclined faces being positioned closely adjacent said one side panel when the latter is engaged by said sealing surface with the heat emanating from said inclined faces serving to drive moisture created by the steam upwardly and downwardly off of the inner sides of said panels in the area of said seal so as to leave said seal area substantially moisture-free.

4,369,612

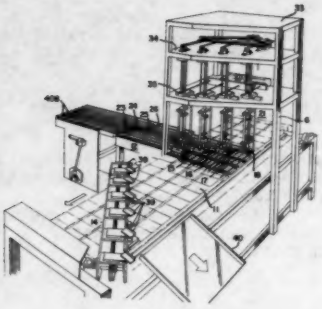
## AUTOMATIC CONFECTION PACKAGING MACHINE

Edward M. Wight, Austin, Tex., assignor to Glacier Industries, Inc., Austin, Tex.

Continuation of Ser. No. 47,573, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 918,376, Jun. 23, 1978, abandoned. This application Jan. 15, 1981, Ser. No. 225,377

Int. Cl.³ B65B 57/14, 35/44, 43/42

U.S. Cl. 53—494 21 Claims



1. Apparatus for transporting confection pieces from a confection production apparatus and packing said pieces in rectilinear arrays, said arrays containing a plurality of confections in each row and a plurality of such rows within containers, comprising,

product transport means for conveying in a first plane in a first direction parallel columns of individual confection prices along individual lanes to a series of individual lane termination points, each of said lane termination points being displaced from one another in said first direction,

container transport means for conveying a plurality of said containers in parallel columns moving in a second direction perpendicular to said first direction, said transport means moving said containers underneath the plane of said product transport means, and

loading means for ejecting a plurality of said confection pieces sufficient to fill each row from each of said lane termination points into said containers.

---

4,369,613

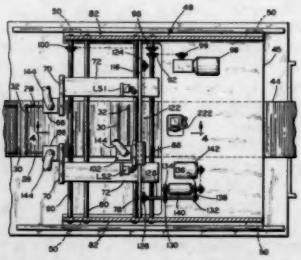
## APPARATUS FOR PRODUCING PACKAGES OF TWO WEBS OF VARYING LENGTHS AND WIDTHS

Larry C. Gess, 9270 Secor Rd., Temperance, Mich. 48182

Filed Mar. 26, 1981, Ser. No. 247,740

Int. Cl.³ B65B 9/02, 51/02, 59/00

U.S. Cl. 53—553 2 Claims



1. Apparatus for making a package comprising a bed having a flat surface, means for guiding and moving a first web of packaging material in a longitudinal path along said surface, a supporting housing positioned on said bed and supported on the bed on each side of the first web, a first applicator for depositing a first strip of adhesive material longitudinally along an edge portion of the first web, a second applicator for depositing a second strip of adhesive material longitudinally along another edge portion of the first web, means supporting said first and said second applicators by said supporting housing, means for depositing a first transverse strip of adhesive material on the first web between the longitudinal strips and for depositing a second transverse strip of adhesive material on the first web between the longitudinal strips, means for depositing a second web of packaging material on the first web, means for pressing the two webs together, and means for severing the webs between adjacent transverse strips, said means supporting said first and second applicators comprising a first supporting member for said first applicator and a second supporting member for said second applicator, means carried by said supporting housing for moving said first supporting member and said second supporting member toward and away from one another substantially equal distances, means for moving said transverse strip depositing means across the first web, and means carried by each of said supporting members for reversing the movement of said moving means when engaged by said transverse strip depositing means.

---

4,369,614

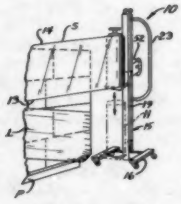
## WRAPPING APPARATUS

Siegfried K. Tetzner, 5307 W. Lake Shore Dr., Wonder Lake, Ill. 60097

Filed Nov. 17, 1980, Ser. No. 207,788

Int. Cl.³ B65B 11/02, 13/04

U.S. Cl. 53—556 10 Claims



1. Apparatus for wrapping a load on a floor-carried pallet comprising:

a carriage having a wheeled base for rolling movement of the carriage on the floor about the pallet-carried load, an upright upstanding from said base, and handle means for manipulation of the carriage in causing the rolling movement thereof;

a carrier for carrying a roll of sheet material on a core for rotation about the roll axis including a flat plate defining a bottom wall support, a spindle upstanding from said bottom roll support rotatably coaxially carrying said roll and having an upper outer end, threaded means coaxially on said outer end of the spindle, a threaded member coaxially threadedly mounted to said threaded means and having an annular shoulder means, a cap having a radial slot permitting said cap to be brought laterally about said member into a dispostion axially outwardly adjacent said spindle outer end with said shoulder means spaced axially outwardly thereof, and means for threading said member on said threaded means to urge said shoulder means axially inwardly and against said cap and retain said cap on said spindle to retain the sheet material roll coaxially on said spindle against movement outwardly from said outer end, wherein said means for threading said threaded member on said threaded means comprises a manipulating handle at its distal end of a size smaller than said core, about

which member and handle the roll is coaxially passed during placement of a sheet material roll on, and during withdrawal of the sheet material roll from, the spindle upon removal of said cap and without removal of said member from said spindle; and

moving means for moving the carrier vertically along the upright as the carriage is moved about the pallet-carried load between a lowermost position wherein the lower edge of sheet material roll on the carrier is disposed substantially at floor level adjacent the bottom of the pallet and an uppermost position wherein the top of the roll is at a position substantially above the top of the upright to permit the upper edge of sheet material withdrawn from said roll to be adjacent the top of the load on the pallet notwithstanding the disposition of the top of the load at an elevation substantially above that of the top of the upright to wrap the entire pallet and load thereon as desired, said moving means including manually operable means disposed adjacent said handle means for facilitated concurrent movement of the carriage about the pallet-carried load and movement of the carrier on the upright in effecting the spiral wrapping.

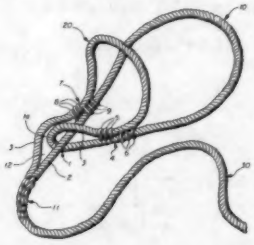
---

**4,369,615**

## ANIMAL HALTER

**Darrell R. Bloodworth, Rte. 2, Box 217-A, Waller, Tex. 77484**

**Filed Jul. 17, 1981, Ser. No. 283,909**
**Int. Cl.³ B68B *1/02***
**U.S. Cl. 54—24** **10 Claims**



1. An animal halter formed only from a single length of rope and without other components comprising:

an eye loop formed by a double portion of said rope, the opposite first and second parts of which are connected at a first point for disposition near one side of the lower jaw of an animal;

a headstall loop formed by an extended and doubled portion of said first part;

a noseband loop formed by an extended and doubled portion of said second part, said extended first and second parts which form said headstall and noseband loops being connected at a second point for disposition near the other side of said lower jaw; and

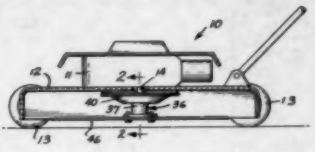
said first and second parts further extending generally side by side from said second point for connection at a third point for disposition below the lower jaw of said animal forming an elongated slot engaged by the bend of said eye loop to allow limited movement of said eye loop between said second and third points and consequent limited adjustment of said headstall and nose band loops.

**4,369,616**

## CENTRIFUGAL CLUTCH AND BRAKE FOR LAWNMOWER

**John M. Cody, 1954 W. Sharon St., and William L. Weaks, 650 S. Virginia St., both of Quincy, Fla. 32351**

**Filed Oct. 27, 1980, Ser. No. 200,825**
**Int. Cl.³ A01D *75/00***
**U.S. Cl. 56—11.3** **7 Claims**



1. A centrifugal clutch and brake apparatus for selectively connecting a rotatable driven element to a power plant having a drive shaft and which is mounted on a support compriaing engaging means carried by the drive shaft of the power plant, return means urging said engaging means toward the axis of the shaft, said return means retracting said engaging means when the power plant is operated at idling speed and permitting said engaging means to be extended by centrifugal action when the power plant is operated at operating speed, said engaging means having a first frictional surface, a housing mounted for rotational and axial movement on the drive shaft of the power plant, said housing including a portion having a second frictional surface which normally is in spaced relationship with said first frictional surface, said housing having first brake means, second brake means fixed to the power plant support, means normally urging said first brake means into engagement with said second brake means, whereby when the drive shaft of the power plant is rotating at idling speed, said engaging means is retracted and said first and second brake means are in engagement with each other, and when the drive shaft is rotating at operating speed, said engaging means is extended so that said first frictional surface is extended into engagement with said second frictional surface of said housing and moves said first brake means out of engagement with said second brake means and causes said housing to be rotated substantially at the speed of rotation of the drive shaft.

---

**4,369,617**

## FEEDER IDLER DRUM SHAFT WITH REMOVABLE EXTENSIONS

**Roger D. Hanaway, Blue Springs, Mo., and Larry R. James, Olathe, Kans., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Jul. 16, 1981, Ser. No. 283,975**
**Int. Cl.³ A01D *41/06*; B65G *23/44*; A01D *57/20***
**U.S. Cl. 56—14.6** **4 Claims**

1. An agricultural harvester having an endless belt conveyor disposed between a pair of vertical side walls of a housing characterized by

an idler drum carrying one end of said conveyor,

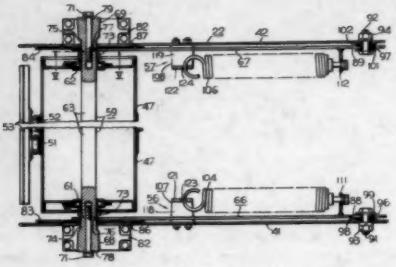
a pair of aligned openings in said side walls at opposite ends of said drum,

a nonrotating shaft having a central portion rotatably carrying said idler drum for rotation about a first transverse horizontal axis and a pair of removable extensions at opposite ends thereof extending through said aligned openings, the length of said central portion of said shaft being less than the distance between said side walls,

a pair of support arms having first corresponding ends connected respectively to said extensions and second corresponding ends pivotally connected to said side walls on a second transverse horizontal axis spaced from said first transverse axis in the direction toward the other end of

said conveyor whereby said shaft is vertically swingable about said second axis to provide a vertical floating condition of said idler drum relative to said housing, and

stop means on the outboard sides of said walls in vertically confronting relation to said extensions limiting vertical swinging movement of said shaft between predetermined



limits, said openings in said side walls being of sufficient size to permit said vertical swinging movement between said limits,

said idler drum and said central portion of said shaft being removable radially as a unit from said housing upon removal of said extensions without removal of said support arms.

---

**4,369,618**

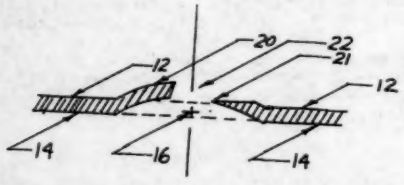
**SAFETY-VAC LAWN MOWER BLADE**

**Joseph C. Dell, R.D. #1, Box 214B, McConnellsburg, Pa. 17233**

**Filed Aug. 27, 1981, Ser. No. 296,845**

**Int. Cl.³ A01D** *55/18*

**U.S. Cl. 56—295** **4 Claims**



1. A rotary lawn mower blade comprising a circular sheet of material forming a disc adapted to rotate about an axis, said disc having a top plane and a bottom plane, said plaines being parallel to each other, said disc having vortex generating elements thereon extending radially from the axis and axially from one of said planes of said disc, said elements having radial slots or openings therein, said slots or openings having a trailing edge forming the cutting blade, said slots or openings and said cutting blades being on the same axial side of said disc.

---

**4,369,619**

**CABLE STRANDING MACHINE**

**Erik S. Nielsen, Stenlose, and Poul Stücker, Vanlose, both of Denmark, assignors to I. Bager & Co. A/S, Rodovre, Denmark**

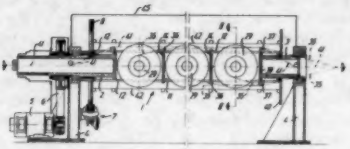
**Filed Apr. 27, 1981, Ser. No. 258,012**

**Claims priority, application Denmark, Apr. 30, 1980, 1916/80**

**Int. Cl.³ D07B** *3/04, 7/06*

**U.S. Cl. 57—58.34** **5 Claims**

1. A cable stranding machine, comprising an elongate rotor supported for rotation about a longitudinal axis and having at least one pair of opposed longitudinal beams; and a plurality of pairs of opposed bobbin bearing devices locked to the longitudinal beams in spaced relationship along the longitudinal direction of the rotor, each bobbin bearing device including a pintle support secured to the respective beam, a pintle rotatably supported by the corresponding pintle support for supporting one end of a thread bobbin for rotation about an axis perpendicular to the rotor axis, and means in connection with at least



one pintle support of each pair for axially displacing the associated pintle relative to its pintle support towards and away from the opposed pintle, at least one pintle support of each pair being stepwise displaceable in the direction of the pintle axis relative to the associated rotor beam between a finite number of predetermined, axially spaced positions, and means for selectively locking each stepwise displaceable pintle support to said rotor beam in each of said predetermined positions.

---

**4,369,620**

**APPARATUS FOR SPINNING-IN YARNS IN OPEN-END ROTOR SPINNING UNITS**

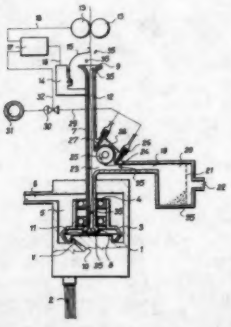
**Frantisek Burysek, Usti nad Orlici; Karel Mikulecky, Chocen; Jiri Elias, Brandys nad Orlici; Stanislav Esner; Stanislav Skoda, both of Usti nad Orlici, and Jan Janousek, Brandys nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usit nad Orlici, Czechoslovakia**

**Filed Feb. 11, 1981, Ser. No. 233,398**

**Claims priority, application Czechoslovakia, Feb. 13, 1980, 1070-80**

**Int. Cl.³ D01H** *15/02*

**U.S. Cl. 57—263** **4 Claims**



1. In an apparatus for spinning-in yarns in an open-end rotor spinning unit having a spinning-in device for returning a yarn end through a take-off duct into the spinning rotor, a severing device for shortening the yarn end to a predetermined length, and a withdrawing duct which communicates with the take-off duct and which is designed, on the one hand, for holding the yarn end by the action of a vacuum which, in the contact region of the two ducts, exceeds the working vacuum in the take-off duct, and, on the other hand, for withdrawing the severed yarn end, the improvement comprising a subatmospheric pressure source connected to the withdrawing duct during both spinning and spinning-in processes, and at least one air nozzle which opens into the withdrawing duct, which nozzle is designed for introducing a fresh end of yarn into the

take-off duct by a controlled air outflow in a predetermined phase of the spinning-in process.

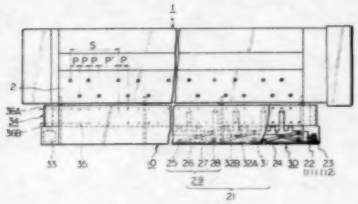
---

**4,369,621**

## METHOD FOR SIMULTANEOUSLY CHANGING BOBBINS IN A FLY FRAME AND APPARATUS FOR CARRYING OUT THE METHOD

**Takashi Kogiso, Mizunami, Japan, assignor to Howa Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Nov. 20, 1981, Ser. No. 323,703**
**Claims priority, application Japan, Nov. 20, 1980, 55-164281**
**Int. Cl.³ D01H 9/08**
**U.S. Cl. 57—267** **13 Claims**



1. Method for simultaneously changing bobbins in a fly frame wherein flyers supported from above are arranged in a zigzag fashion in front and back rows extending in the longitudinal direction of said fly frame, which method comprises: supplying empty bobbins in a zigzag fashion on pegs mounted on a conveyor of a bobbin changing apparatus before stoppage of said fly frame upon completion of full bobbins; advancing bobbin changing arms of said bobbin changing apparatus from a standby position thereof to full bobbins on the fly frame after the stoppage of said fly frame; simultaneously doffing said full bobbins by said bobbin changing arms; retracting said bobbin changing arms with said full bobbins and moving said conveyor so as to pass said full bobbins through spaces between adjacent empty bobbins; inserting said full bobbins onto empty pegs of the conveyor; moving said conveyor to locate said empty bobbins at positions corresponding to said bobbin changing arms; advancing said bobbin changing arms to remove said empty bobbins from said pegs; further advancing said arms with said empty bobbins toward the fly frame and moving said conveyor so as to pass said empty bobbins through spaces between adjacent full bobbins on the conveyor; donning said empty bobbins on said fly frame; and retracting said arms to said standby position.

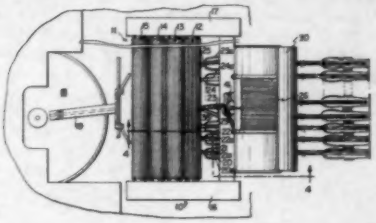
7. Apparatus for simultaneously changing bobbins in a fly frame, wherein flyers are arranged in a zigzag fashion in front and back rows extending in the longitudinal direction of said fly frame, which apparatus comprises: bobbin changing arms having bobbin supporting parts at the free ends thereof, said bobbin supporting parts being arranged in a zigzag fashion corresponding to said zigzag arranged flyers; a connecting member for supporting all of said bobbin changing arms; reciprocation means for horizontally reciprocating said connecting member towards said fly frame and therefrom; lifting means for lifting said connecting member; a conveyor located under said bobbin changing arms at a standby position and having two rows of pegs, half of said pegs being arranged corresponding to the zigzag arranged flyers, and the remaining half of said pegs being equally and longitudinally shifted from the other half of said pegs a predetermined certain distance in one direction; conveyor moving means for moving said conveyor to and fro; means for controlling said lifting means; and means for controlling the cooperative movements of said reciprocating means with said conveyor moving means so as to pass bobbins supported by said bobbin changing arms through spaces between adjacent bobbins mounted on said pegs of said conveyor.

**4,369,622**

## METHOD AND APPARATUS FOR DRAWING AND BLENDING TEXTILE MATERIALS

**Richard K. Teed, Greenwood, and Arther M. Pressley, Ware Shoals, both of S.C., assignors to Riegel Textile Corporation, Ware Shoals, S.C.**

**Filed Mar. 24, 1980, Ser. No. 132,785**
**Int. Cl.³ D01G 1/06, 13/00; D01H 5/00**
**U.S. Cl. 57—315** **18 Claims**



1. A method of drawing and blending at least two bundles of fibrous materials while maintaining contact with each other comprising:

(a) feeding at least one bundle of a first fibrous material through draw rollers of a drawing frame;

(b) supporting a roll of a bundle of second fibrous material adjacent the rearmost rollers of the drawing frame;

(c) unwinding said roll of said bundle of second fibrous material adjacent said rearmost rollers of the drawing frame;

(d) feeding said second fibrous material bundle into said rearmost rollers of the drawing frame simultaneously with said first fibrous material bundle; and

(e) guiding said first fibrous material bundle and said second fibrous material bundle relative to each other such that the latter is continuously cushioned by said first material bundle with respect to said draw rollers when passing therethrough.

12. An apparatus for supporting at least one spool of a bundle of textile fibrous material and for permitting unwinding of said bundle of fibrous material for introduction into a drawing frame for blending with at least a second fibrous material comprising a drawing frame, a support container having a generally arcuate cross-sectional configuration for nestled reception of the spool therein and positioned so as to permit continuous unwinding of the bundle of fibrous material when tension is applied thereto, means for guiding the bundle of fibrous material adjacent the container so as to guide the fibrous material in a predetermined direction into the rearmost draw rollers of the drawing frame after unwinding from the spool.

---

**4,369,623**

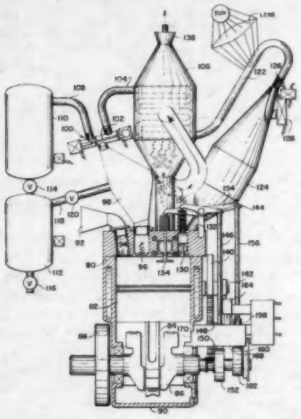
## POSITIVE DISPLACEMENT ENGINE WITH SEPARATE COMBUSTION CHAMBER

**David E. Johnson, 173 West Ave., Canandaigua, N.Y. 14424**

**Continuation of Ser. No. 863,858, Dec. 20, 1977, abandoned, and a continuation of Ser. No. 710,092, Jul. 30, 1976, abandoned, which is a continuation of Ser. No. 558,371, Mar. 14, 1975, abandoned. This application Sep. 18, 1980, Ser. No. 188,573**
**Int. Cl.³ F02G 1/02**
**U.S. Cl. 60—39.6** **11 Claims**

1. A low pressure, low combustion temperature engine of the Brayton or Joule type having reduced level of pollutants in its exhaust and having a steady state mode, a braking mode and a peak power mode, the engine comprising: means defining at least one power stage including a positive displacement chamber; a combustion chamber located externally of said displacement chamber to supply a power fluid to said displacement

chamber; a reciprocating piston provided in said displacement chamber and driven by said power fluid during power strokes of an operating cycle; air inlet means including a first valve opening into said displacement chamber for supplying air at ambient atmospheric pressure to said displacement chamber and air outlet means including a second valve opening out of said displacement chamber for allowing compressed air to exit said displacement chamber, said air inlet means and said air outlet means operating during a portion of engine operation to provide compressed air for passage via said outlet means to said combustion chamber to form part of the power fluid during power strokes in the steady state mode, said air outlet means supplying air from said displacement chamber during about each fifth stroke of said piston during the normal steady



state mode of the engine; and accumulator coupled to said displacement chamber to receive compressed air therefrom via said air outlet means and to supply stored compressed air to said combustion chamber; control means effective during a braking mode of operation to interrupt flow of power fluid from said combustion chamber to said displacement chamber via a third valve and flow of exhaust from said displacement chamber via a fourth valve and to enable said piston to compress air on each compressing stroke and pass compressed air to said accumulator; and means to selectively supply compressed air from said accumulator to said combustion chamber both on starting the engine and during the full power mode of the operating cycle while interrupting flow of air from said displacement chamber to said accumulator.

---

**4,369,624**

## HIGH TEMPERATURE GAS TURBINE SYSTEMS

**James R. Hamm, Murrysville, and William E. Young, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jan. 2, 1981, Ser. No. 222,093**
**Int. Cl.³ F02B *43/08***
**U.S. Cl. 60—39.12** **1 Claim**

1. A high temperature gas turbine generation system comprising:

a compressor;

means for conducting a gaseous oxidant to said compressor;

a combustion heater wherein one of a fuel gas and a pulverized carbonaceous material is combusted to produce heat and reaction products;

means for conducting compressed gaseous oxidant to and through said combustion heater so as to heat said oxidant;

a reactor housing a fluidized bed wherein particulate coal is reacted with a discharge gas to produce heat and said fuel gas;

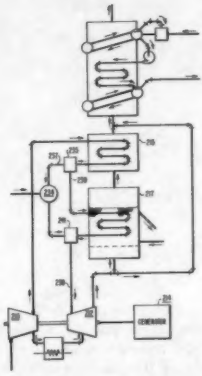
means for conducting said fuel gas from said reactor to said combustion heater;

a combustor producing a high temperature gaseous product from said heated oxidant and a gaseous fuel;

means for conducting said gaseous fuel to said combustor;

means for conducting a first portion of said heated oxidant to said combustor;

means for conducting a second portion of said heated oxidant to and through said reactor so as to further heat said second portion of oxidant;



means for mixing said high temperature gaseous product and said further heated second portion of oxidant into a mixture;

an expander having an inlet for receiving said mixture and an outlet for discharging said discharge gas;

means for conducting said mixture to said expander inlet; and

means for conducting said discharge gas from said expander outlet to said reactor.

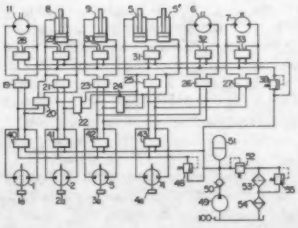
---

**4,369,625**

## DRIVE SYSTEM FOR CONSTRUCTION MACHINERY AND METHOD OF CONTROLLING HYDRAULIC CIRCUIT MEANS THEREOF

**Eiki Izumi, Chiyodamura; Kazuo Honma, Amimachi; Katsuro Abe, Matsudo; Masaaki Uno, Toride, and Kichio Nakajima, Chiyodamura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan**

**Filed Feb. 20, 1980, Ser. No. 123,087**
**Claims priority, application Japan, Jun. 27, 1979, 54-80212; Oct. 19, 1979, 54-134259**
**Int. Cl.³ F16H *39/46***
**U.S. Cl. 60—327** **13 Claims**



8. A method of controlling hydraulic circuit means of a drive system for construction machinery in which said hydrau-

lic circuit means includes a plurality of variable-displacement hydraulic pumps and a plurality of hydraulic actuators, each said pump being connected in closed circuit to one or a plurality of said actuators through a solenoid-operated valve or valves to drive a movable member or members connected to the actuator or respective actuators when pressurized fluid is supplied to the actuator or actuators from the pump, at least one of the selected hydraulic actuators being further connected in closed circuit through a solenoid-operated valve to at least one of the hydraulic pumps other than the hydraulic pump which is connected in closed circuit to the selected hydraulic actuator, characterized in that said method comprises the steps of: setting a preprogrammed priority order of hydraulic communication between each hydraulic pump and the hydraulic actuators to which said hydraulic pump is connected in closed circuit through the respective solenoid-operated valves generating command signals by an operator; closing all of said solenoid-operated valves when no command signals for driving said actuators are produced; when a command signal for driving at least one actuator is produced, opening the solenoid-operated valve associated with said one actuator or the actuator higher in the priority order of hydraulic communication with said hydraulic pump while controlling the delivery of the pump by the command signal for driving the actuator with which said opened valve is associated; when at least one of command signals which have been produced to drive at least one actuator is removed, closing the solenoid-operated valve associated with the actuator which have been driven by the removed command signal and/or opening or keeping open the solenoid-operated valve associated with the other actuator or actuator higher in the priority order of hydraulic communication with said hydraulic pump among the other actuators while controlling the delivery of the pump by the command signal for driving the actuator with which said opened or opening-kept valve is associated; and conducting any switching of each said solenoid-operated valve only when the delivery of said pump is zero or has been reduced substantially to zero.

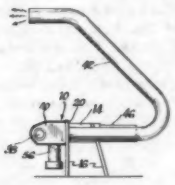
---

**4,369,626**

## HOT-AIR DISTRIBUTION SYSTEM

**Thomas T. Frankie, 2415 Plaza Del Mar, Escondido, Calif. 92025**

**Filed Jul. 30, 1981, Ser. No. 288,619**
**Int. Cl.³ F23H *13/00*; F02G *1/02***
**U.S. Cl. 60—517** **15 Claims**



1. A heated fluid distributor for space heating which utilizes a heat source to both operate a Stirling engine and heat fluid moved by a mechanical fluid mover operated by said Stirling engine, said distributor comprising:

(a) a frame;

(b) a Stirling engine mounted on said frame with the hot end of the displacement cylinder extendable into thermal contact with said heat source when the distributor is in its operative mode;

(c) means defining a fluid path passing relatively cool ambient air in thermal contact with said heat source when the distributor is in operative mode to warm said air, and said fluid path being hermetically separated therefrom to prevent the admixture of any combustion gases from said source to said air to adulterate same, said fluid path also being directed into and terminating in communication with the ambient space to be heated to deliver unadulterated air so warmed thereinto; and

(d) a mechanical fluid mover operated by said engine to drive said fluid along said path.

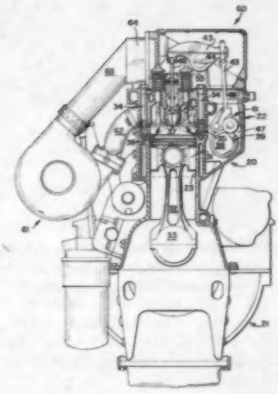
---

**4,369,627**

## INTERNAL COMBUSTION ENGINE

**Edward W. Kasting, Seymour, and Richard E. Glasson, Columbus, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.**

**Continuation of Ser. No. 958,532, Nov. 7, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 160,004**
**Int. Cl.³ F02F *1/42***
**U.S. Cl. 60—605** **18 Claims**



1. An internal combustion engine comprising a block having at least one pair of engine cylinders formed therein, a head fastened to said block and having two air intake ports and two exhaust ports formed therein for each cylinder, said ports communicating with the associated cylinders, a turbocharger mounted on one side of said block and said head, said two air intake ports and said two exhaust ports of each cylinder being arranged at substantially 90° intervals around the cylinder axis, one of said exhaust ports being adjacent said one side, one of said intake ports being adjacent the opposite side of said head, and the remaining intake and exhaust ports being between said one intake and said one exhaust ports, an exhaust opening for each cylinder formed in said one side of said head, an exhaust passage for each cylinder formed in said head and communicating with said exhaust opening and exhaust ports of the associated cylinder, said head including an upper wall, a bottom wall, and internal walls between said upper and bottom walls, an intake opening formed in said upper wall of said head substantially between the cylinders of said pair of cylinders, said walls forming an enlarged intake air chamber in said head and communicating with said intake opening, said internal walls extending around said intake air ports of said pair of cylinders, said chamber extending to said bottom wall and including the areas adjacent said air intake ports of said pair of cylinders, the intake air flowing generally parallel to said cylinders out of said chamber and through said air ports, a rocker housing fastened to said upper wall of said head, an intake air passage formed in said rocker housing, an intake air duct connected to said turbocharger and to said housing on said one side of the engine which is adjacent the exhaust openings, said intake air passage of said rocker housing communicating with said intake air duct and with said intake opening of said head, and exhaust ducts on said one side and connecting said turbocharger with said exhaust openings.

4,369,628

## METHOD AND APPARATUS FOR IMPROVING THE FIREDAMP SAFETY OF AN INTERNAL COMBUSTION ENGINE FOR UNDERGROUND OPERATION

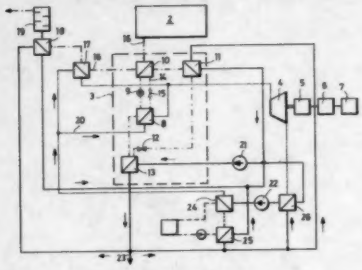
Martin Brunn, Bonn, Fed. Rep. of Germany, assignor to Brunn GmbH & Co. KG, Bonn, Fed. Rep. of Germany

Filed Aug. 13, 1980, Ser. No. 177,820

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933137

Int. Cl.³ F02G 5/04

U.S. Cl. 60—618 8 Claims



1. A method for improving the firedamp safety of an assembly for use in underground mine workings, the assembly including an internal combustion engine generating hot exhaust gases, an absorption-type refrigeration machine having a refrigerant circuit for generation of a refrigerated fluid stream, a turbine having a discharge side and a turbine circuit which includes a working medium and a heat exchanger, said method comprising the steps of:

operating the absorption-type refrigeration machine by passing the hot exhaust gases of the internal combustion engine through said refrigeration machine in a manner to effect heat exchange;

cooling the exhaust gases of the internal combustion engine which exit the refrigeration machine by transferring heat therefrom to the refrigerated fluid stream;

heating the turbine working medium by transferring heat thereto from the exhaust gases of the internal combustion engine in the turbine heat exchanger; and

cooling in the refrigerant circuit with the turbine working medium.

---

4,369,629

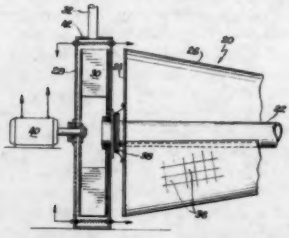
## NATURAL ENERGY EXTRACTOR

Lawrence B. Lockwood, 5935 Folsom, La Jolla, Calif. 92037

Filed Jan. 8, 1981, Ser. No. 223,235

Int. Cl.³ F24J 3/00

U.S. Cl. 60—698 7 Claims



1. A wind rotor comprising:

(a) a heat-conductive rotary shaft;

(b) heat conductive wind vanes extending from said shaft to deliver absorbed solar heat to said shaft; and

(c) heat accumulation means operative with said shaft to collect the heat delivered therefrom.

---

4,369,630

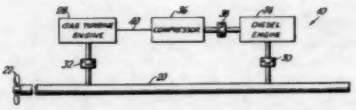
## COMBINATION DRIVE SYSTEM FOR SHIPS

Warren Bloomfield, Norwalk, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Feb. 19, 1981, Ser. No. 235,956

Int. Cl.³ F02B 73/00

U.S. Cl. 60—718 4 Claims




1. A drive system for supplying power to a propeller shaft of a ship comprising in combination:

a main driving engine detachably coupled to said shaft for generating a low power output with high fuel efficiency;

a gas turbine engine detachably coupled to said shaft, said gas turbine engine generating high power output; and

a compressor detachably coupled to said main driving engine and fluidly communicating with said gas turbine engine to supply compressed air to the inlet thereof for increasing the power generated by said gas turbine engine, maximum total output power to the shaft being generated by detaching said main driving engine from said shaft and coupling said main driving engine to said compressor such that the power output generated by said main driving engine is utilized to drive said compressor, which functions to supercharge the air input to said gas turbine engine.

---

4,369,631

## REFRIGERATED MERCHANDIZER DISPLAY CASE ADAPTED FOR ENERGY CONSERVATION

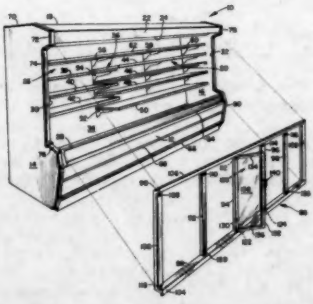
Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 101,069, Dec. 7, 1979, Pat. No. 4,265,090, which is a continuation-in-part of Ser. No. 25,473, Jun. 30, 1979, Pat. No. 4,245,482, and Ser. No. 58,916, Jul. 19, 1979, Pat. No. 4,242,882. This application Apr. 18, 1980, Ser. No. 141,359

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.³ F25D 21/12; A47F 3/04

U.S. Cl. 62—82 98 Claims



1. In an open front display cabinet having refrigeration

means and a display space therein; aperture means in at least one wall thereof for communicating ambient outside air with the air in said cabinet, said aperture means comprising an access opening for permitting products to be moved into and out of said display space; at least one air conduit positioned about said display space and having an outlet opening and an inlet opening at opposite ends thereof so that air leaving said air conduit outlet opening will be directed toward and received by said inlet opening; an air moving means for propelling at least one air band comprising a refrigerated air band through said air conduit during a refrigeration cycle and for propelling ambient air through said cabinet during a defrost cycle; and said refrigeration means arranged within said air conduit; the improvement comprising: a barrier door retrofitted into said display cabinet for substantially covering said access opening, air defrost means arranged in association with said display cabinet for selectively creating a gap between said barrier door and said access opening for enabling passage of ambient air into said air conduit to remove frost from said refrigeration means during a defrost cycle of operation, and said air moving means enabling propulsion of ambient air within said air conduit during a defrost cycle of operation to facilitate frost removal from said refrigeration means.

70. A method of improving the energy efficiency of a refrigerated display cabinet having an air defrost system, a display space therein, aperture means in at least one wall thereof for communicating ambient outside air with the air in the cabinet, the aperture means comprising an access opening for permitting products to be moved into and out of the display space, at least one air band circulated within the cabinet for selectively maintaining a flow pattern inside of the cabinet across the access opening and cooled by contact with a refrigeration means during a refrigeration cycle of operation and, a control means for selectively operating the air band and the refrigeration means to refrigerate the cabinet during a refrigeration cycle and to defrost the refrigeration means during a defrost cycle; the method comprising the steps of: installing covering means for the aperture means including at least one barrier door for substantially covering the access opening, fitting an air defrost means comprising at least one door operating mechanism into association with the display cabinet for enabling creation of a gap between the barrier door and the access opening; adjusting the control means of the display cabinet to enable operation during a refrigeration cycle including, circulating the air band through the display cabinet to form an air curtain across the access opening along a path inside of the barrier door, and propelling the air band through the refrigeration means; adjusting the control means to enable operation during a defrost cycle including, reducing operation of the refrigeration means, causing ambient air to be drawn into the cabinet and pass through the refrigeration means, ejecting defrost ambient air from the cabinet, and creating a gap between the barrier door and the access opening by operating the air defrost means to enable ambient air through-flow; whereby the barrier door increases the energy efficiency by decreasing contact of the ambient air with the air band during a refrigeration cycle in which the barrier door is not open, and wherein ambient air is drawn across the refrigeration means during a defrost cycle of operation to defrost the same.

**4,369,632**

## REFRIGERATED MERCHANDIZER DISPLAY CASE

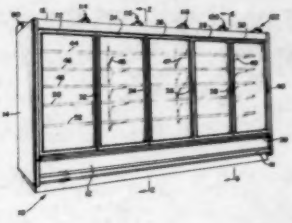
**Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.**

**Continuation-in-part of Ser. No. 101,069, Dec. 7, 1979, Pat. No. 4,265,090, which is a continuation-in-part of Ser. No. 25,473, Mar. 30, 1979, Pat. No. 4,245,482, and Ser. No. 58,916, Jul. 19, 1979, Pat. No. 4,242,882. This application Apr. 18, 1980, Ser. No. 141,360**

**The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.**

**Int. Cl.³ F25D *21/12, 23/02***

**U.S. Cl. 62—82** **92 Claims**



1. In a display cabinet having refrigeration means and a display space therein, aperture means in at least one wall of said cabinet for communicating ambient outside air with the air in said cabinet, said aperture means comprising an access opening for permitting products to be moved into and out of said display space, air moving means for circulating at least one air band within said cabinet and into contact with said refrigeration means during a refrigeration cycle, covering means for said aperture means including a barrier door for substantially covering said access opening, and said refrigeration means including a low temperature element; the improvement comprising: air defrost means for selectively creating a gap between said barrier door and said access opening, said air defrost means causing said air moving means to pass ambient air through said cabinet and through the gap between said barrier door and said access opening during a defrost cycle to bring the ambient air into contact with said low temperature element to remove frost therefrom and to thereafter eject the defrost ambient air from said cabinet, means for providing a plurality of air bands for circulation within said cabinet during a refrigeration cycle, and, control means for selectively operating said air defrost means and said refrigeration means to defrost said low temperature element during a defrost cycle and to refrigerate said cabinet during a refrigeration cycle.

73. A method of operating a refrigerated display cabinet comprising a cabinet having a display space therein, and aperture means in at least one wall thereof for communicating ambient outside air with the air in the cabinet, the aperture means comprising an access opening for permitting products to be moved into and out of the display case, covering means for the aperture means including a barrier door for substantially covering the access opening, the barrier door being movable for enabling access to the cabinet, at least one air conduit extending about the display space and having an outlet opening and an inlet opening at opposite ends thereof, with the outlet opening and inlet opening being arranged in aerodynamic alignment so that air leaving the air conduit outlet opening will be directed toward the received by the inlet opening, and an air moving means for propelling a refrigerated air band through the air conduit during a refrigeration cycle and for propelling ambient air through the cabinet during a defrost cycle, and a refrigeration means arranged within the air conduit; the method comprising the steps of: selectively operating the display cabinet in a refrigeration cycle of operation and in a defrost cycle of operation; during a refrigeration cycle, circulating the air band through the air conduit so that air is expelled from the outlet opening and received by the inlet opening so as

to form an air curtain across the access opening in the cabinet along a path inside of the barrier door, and propelling the air band through the refrigeration means; during a defrost cycle operation, terminating operation of the refrigeration means, causing ambient air to be drawn into the cabinet, pass through a substantial portion of the air conduit, and across the refrigeration means, causing the defrost ambient air to be ejected from the cabinet, and creating a gap between the barrier door and the access opening to enable ambient air through-flow; whereby ambient air is drawn into the air band and across the refrigeration means to defrost the same by communicating ambient air with the air band in the display cabinet.

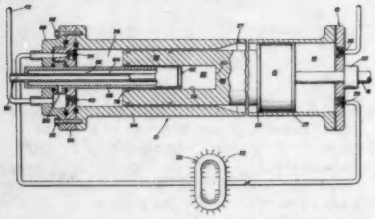
---

**4,369,633**

## MULTIPLE STAGE COMPRESSOR WITH FLASH GAS INJECTION ASSEMBLY

**David A. Snyder, 9350 W. Jamaica, Baton Rouge, La. 70815**

**Filed Sep. 3, 1981, Ser. No. 299,215**
**Int. Cl.³ F25B *5/00***
**U.S. Cl. 62—117** **25 Claims**



**1.** In a multi-stage fluid compression system having at least a low pressure compression stage and a higher pressure compression stage receiving pressurized fluid from said low pressure stage and providing higher pressure output fluid, the improvement comprising:

an intermediate pressure fluid injection system connected to said higher pressure compression stage, including:

first inlet means for the intermediate pressure fluid;

a first compression chamber for increasing the pressure of the intermediate pressure fluid to a raised pressure level;

first valve means for passage of the intermediate pressure fluid from said first inlet to said first compression chamber therefor;

second valve means for passage of the raised pressure fluid from said first compression chamber; and

outlet means for the higher pressure fluid and the raised pressure fluid output by said higher pressure compression stage and by said first compression chamber, respectively.

---

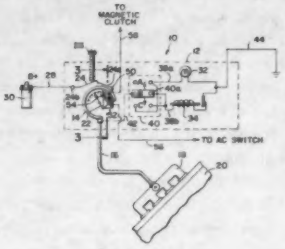
**4,369,634**

## FUEL-FLOW MONITOR AND AUTOMATIC AIR-COMPRESSOR CUT-OFF

**Howard Ratto, 811 Fire Island Ave., West Islip, N.Y. 11795**

**Continuation-in-part of Ser. No. 140,310, Apr. 14, 1980, abandoned. This application Jan. 9, 1981, Ser. No. 223,790**
**Int. Cl.³ F25B *49/00*; B60Q *1/00***
**U.S. Cl. 62—126** **11 Claims**

**1.** A fuel-flow monitor and automatic air compressor cut-off comprising a vacuum responsive means operatively connected to the vacuum of an engine and displaceable in response to changes in the engine vacuum, first switch means spaced from and acapted to be activated by a given displacement of said responsive means, signal means electrically connected with said first switch means, second switch means in electrical circuit with the magnetic clutch of the air compressor, said second switch means being normally closed and adapted to be operated by said responsive means upon a given displacement of same, and means for independently adjusting the position of said first and second switch means relative to said responsive means so that when changes in engine vacuum cause said displacements of said responsive means, a defined movement of said responsive means operates said second switch means open-




ing same to terminate electrical power to the magnetic clutch and operates said first switch means to apply power to said signal means to indicate that the engine is being operated inefficiently.

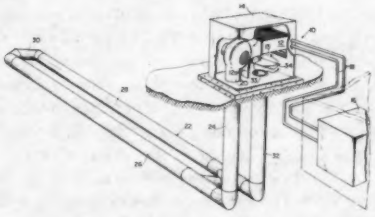
---

**4,369,635**

## SUBTERRANEAN HEATING AND COOLING SYSTEM

**Roland Lambert, Longwood, Fla., assignor to Ladek Corporation, Longwood, Fla.**

**Continuation-in-part of Ser. No. 51,405, Jun. 25, 1979, Pat. No. 4,279,291. This application Mar. 27, 1981, Ser. No. 248,427**
**Int. Cl.³ F25B *29/00***
**U.S. Cl. 62—260** **8 Claims**



**1.** A method of operating a heat pump having only a single inlet for air from which heat is to be extracted, said air inlet being disposed outside of a building to be heated or cooled, said method comprising:

providing an underground pathway for air travel, said pathway having an inlet and an outlet and being located at a level beneath the surface of the ground where the temperature is substantially constant;

coupling said underground pathway outlet with said heat pump inlet whereby air for said heat pump is provided solely by said pathway; and forcing a quantity of air through said pathway for operation of said heat pump.

---

**4,369,636**

## METHODS AND APPARATUS FOR REDUCING HEAT INTRODUCED INTO SUPERCONDUCTING SYSTEMS BY ELECTRICAL LEADS

**John R. Purcell; Wilkie Y. Chen, both of San Diego, and Walter E. Toffolo, Solana Beach, all of Calif., assignors to General Atomic Company, San Diego, Calif.**

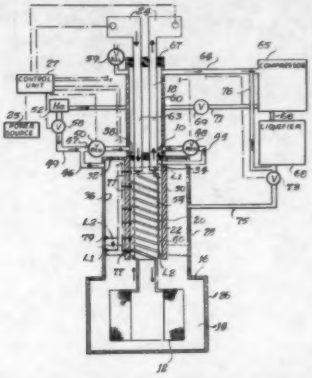
**Filed Jul. 6, 1981, Ser. No. 280,325**
**Int. Cl.³ F25B *19/00***
**U.S. Cl. 62—514 R** **10 Claims**

**1.** In combination,

a superconducting magnet and cooling apparatus therefor, said cooling apparatus comprising:

a containment vessel for cryogenic liquid, said superconducting magnet being disposed within said containment vessel;

electrical leads connected at a lower end to said superconducting magnet and extending a vertical distance thereabove within said containment vessel and exterior of said containment vessel for connection to an external power source, said electrical leads having superconductive portions; and



level adjustment means to alternately lower and raise the level of cryogenic liquid within said vessel around said leads between a lower level, at which selected superconductive segments of said leads within said containment vessel lie above the cryogenic liquid providing thermally insulating barriers between said cryogenic liquid and exteriorly extending lead segements, and an upper level, at which said selected superconductive segments are immersed in cryogenic liquid and are electrically superconducting.

---

**4,369,637**

## CIRCULAR KNITTING MACHINES

**Arrigo Micheletti, Viale Papa Giovanni XXIII°, No. 3, Fucecchio, Firenze, Italy**

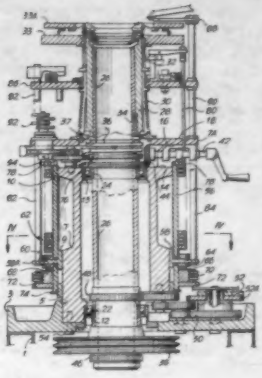
**Filed Jul. 3, 1980, Ser. No. 165,698**

**Claims priority, application Italy, Jul. 9, 1979, 11726/79[U]**

**Int. Cl.³ D04B** *9/02, 15/66*

**U.S. Cl. 66—8** **2 Claims**

1. In a circular knitting machine having a rotatable assembly (26) including a needle cylinder (28), a cam drum (56), a program drum (68), and a pair of bearings (24, 22) for rotatably supporting the rotatable assembly, the improvement comprising a single hollow supporting body (7) having: an upper annular flange (7*a*) with a top lathe-turned radially extending surface (18) and a bottom lathe-turned radially extending surface (16); a lower annular flange with top radially extending lathe-turned surface (14) spaced from and facing said upper flange bottom surface (16) to form therewith facing component-mounting surfaces, and a first outer cylindrical lathe-turned surface (10), a second outer cylindrical lathe-turned surface (9) on said supporting body spaced below said outer cylindrical surface (10) and adjacent a lower end of said body; a centering element (58) mounted over said second outer cylindrical surface (9); a first inner lathe-turned cylindrical surface (13) defined on an interior of said body adjacent a top end thereof; and a second inner lathe-turned cylindrical surface (12) defined on the interior of said body adjacent the lower end thereof; one of the pair of rotatable assembly bearings connected between the rotatable assembly and each of said first and second inner cylindrical surfaces with the needle cylinder extending upwardly of said first inner cylindrical surface; the cam lathe-turned mounted on said first outer cylindrical surface (10) and said centering element (58) at respective upper



and lower ends of the cam drum; a ring (74) on said second outer cylindrical surface (9); the program drum mounted under said centering element (58) and over said ring (74).

---

**4,369,638**

## METHOD AND APPARATUS FOR KNITTING HOLLOW ARTICLES

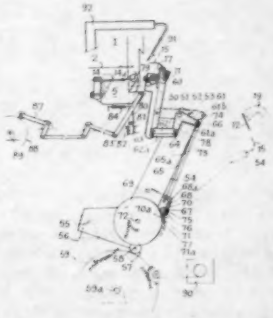
**Henri L. Estingoy, 104 rue Navarrot, Oloron-Ste. Marie, France (64400)**

**Continuation-in-part of Ser. No. 960,163, Nov. 13, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 201,169**

**Claims priority, application France, Nov. 17, 1977, 77 34610**

**Int. Cl.³ D04B** *9/40*

**U.S. Cl. 66—148** **9 Claims**



1. In a method of manufacturing a hollow knitted article including knitting a flat piece having opposite ends by using at least some of the needles in one bed of a flat bed knitting machine, said ends containing an equal number of knit loops, and then seaming the corresponding loops of said ends together by sewing, the improvement comprising:

knitting a first row of loops to forme one end of said piece;

transferring said first row of loops onto the points of a first support located underneath and substantially in vertical alignment with the front end of said needles in said needle bed in their knocking over position, said first support having a number of points equal to the number of loops in said first row;

continuing the knitting of said piece until a row of loops forming the other end is completed while keeping said

first row of loops on the points of said first support adjacent said needles to cause said piece to fold while being knit with its finished side on the inside; and

upon completion of knitting of said piece, transferring the loops from said other end onto a second support having points arranged to retain loops from both said ends;

transferring the first row loops from the points of the first support to corresponding points of the second support;

bringing the corresponding loops of said ends adjacent each other on the points of said second support;

and,

joining said corresponding loops together on the points of said second support by sewing while the finished sides of the piece lie between the ends of the article facing each other.

---

**4,369,639**

## WARP KNITTING MACHINE APPARATUS

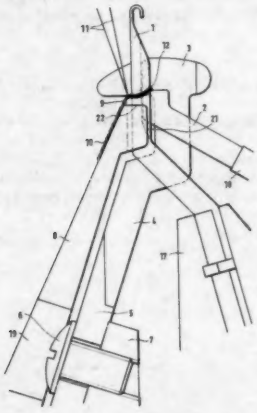
**Roland Wunner, Bernstein, Fed. Rep. of Germany, assignor to LIBA Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany**

**Filed Mar. 3, 1981, Ser. No. 240,231**

**Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008277**

**Int. Cl.³ D04B *23/00***

**U.S. Cl. 66—203** **2 Claims**



1. A warp knitting machine apparatus which withdraws a fabric (10) over a fixed knock-over edge (9) of a knock-over bar (8), has a piercing comb including single sinkers (3) moveble to and fro between needles (1) that hold the fabric, a needle slider (2) for moving each needle, said sinker (3) having a lower edge extending approximately at right angles to the needles (1) in a specific position in relation to the knock-over edge (9) characterized in that a sinker bar (7) for a sinker mounting (5) is disposed between the knock-over bar (8) and a needle bar (17) for the needle (1).

---

**4,369,640**

## APPARATUS FOR OBTAINING UNIFORM SOLID COLORS OR VARIEGATED PATTERNS IN FABRICS

**Gary R. Fox, Ringgold, Ga., assignor to Wadsworth-Greenwood Corporation, Fort Oglethorpe, Ga.**

**Continuation-in-part of Ser. No. 179,752, Aug. 20, 1980, abandoned. This application Jan. 23, 1981, Ser. No. 227,939**

**Int. Cl.³ D06B *1/06***

**U.S. Cl. 68—205 R** **16 Claims**

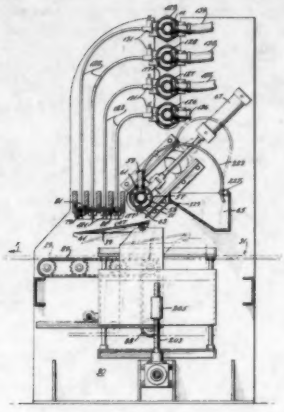
1. Apparatus for producing dye coloration in fabric comprising:

(a) a supporting bed for supporting the fabric substantially horizontally;

(b) an applicator member including

(i) an applicator edge positionable across the width of a moving length of said fabric, and

(ii) a smooth upper surface inclined toward said applicator edge;



(c) means for delivering a primary coating material onto said smooth upper surface to form a continuous sheet thereof flowing by gravity toward said applicator edge, the means including a conduit having a plurality of outlet ports spaced apart in a row extending across the supporting bed; and

(d) foamer means for causing the coating material to be in a foamed condition as it is delivered from the outlet ports and as it forms the continuous sheet.

---

**4,369,641**

## TIMELOCK DEVICE

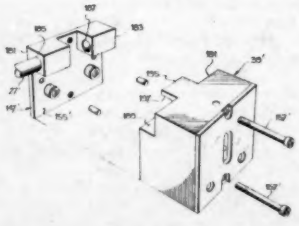
**Erich Wallach, 1615 St-Jean Baptiste, St-Roch Comte Vercheres, Quebec, Canada (J0L 2R0)**

**Filed Jul. 18, 1980, Ser. No. 170,173**

**Claims priority, application Canada, Jul. 19, 1979, 332116**

**Int. Cl.³ E05B *43/00***

**U.S. Cl. 70—272** **5 Claims**



1. A timelock device comprising:

a first fixed part, said first part including a base member, and fastening means for mounting the base member at a location where the device is to be used;

a second detachable part, said second part including a housing, a channel in the back of the housing, a locking pin and a timer carried by the housing, and a mechanism operable

by the timer for moving the locking pin through the channel; and

fastening means for detachably mounting the second part to the first part;

wherein the base member closes the channel when the housing is detachably mounted on the base member to define therewith a passageway for a locking bolt, and the locking pin, when moved into the channel, blocks passage of the locking bolt through the passageway, the timer being operable to withdraw the locking pin from the channel after a predetermined period of time.

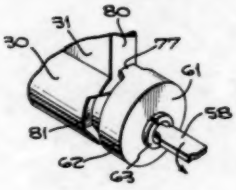
---

**4,369,642**

## DETAINED KEY ASSEMBLY

**Gary J. Grell, Bellflower, Calif., assignor to Norris Industries, Inc., Long Beach, Calif.**

**Filed Mar. 25, 1981, Ser. No. 247,381**
**Int. Cl.³ E05B *11/00***
**U.S. Cl. 70—389** **7 Claims**




1. A deadlock device including a dead bolt, an inside key actuated mechanism having a tailpiece in operating engagement with the dead bolt for shifting said dead bolt between an extended locked position and a retracted unlocked position, said key actuated mechanism comprising a relatively stationary housing, a cylinder within the housing having a chamber and a cylinder plug rotatably mounted in said chamber and in operating engagement with the tailpiece, complementary pin chambers respectively in said cylinder and said plug adapted for alignment with each other in unlocked position whereby a key can be inserted and withdrawn, the improvement comprising means for effecting detention of the key in said plug when the dead bolt is in locked position and release of the key when the dead bolt is in unlocked position, said means comprising cam means including a relatively rotatable cam element in engagement with said tailpiece and a relatively stationary complementary cam element, said cam elements having positions of mutual engagement in one rotative position of the tailpiece with the dead bolt in unlocked position wherein the pin chambers respectively of said cylinder and said plug are held in longitudinal alignment to permit withdrawal of the key, said cam elements having positions of mutual release in another rotative position of the tailpiece with the dead bolt in locked position enabling longitudinal misalignment of the pin chambers respectively of said cylinder and said plug to prevent withdrawal of the key.

---

**4,369,643**

## CLOSURE WITH SMOOTH EDGE

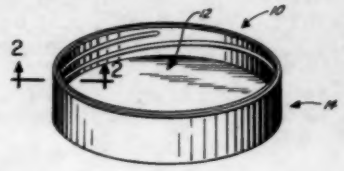
**Cosmo J. Cianciolo, Wolcott; John R. Snyder, Oakville, both of Conn., and Roderick V. King, Girard, Pa., assignors to Ethyl Products Company, Richmond, Va.**

**Filed Nov. 28, 1980, Ser. No. 211,319**
**Int. Cl.³ B21C *37/30*; B24B *39/00***
**U.S. Cl. 72—75** **4 Claims**

1. A method for rounding the edge of a cylindrical, hollow metal closure having a closed end and an open end having a sharp outer edge portion produced by pinch trimming waste material from the open end of the closure comprising:

a. holding the metal closure so that its open end is free;

b. contacting only the sharp outer edge portion of the open end of the metal closure solely with a plurality of metal spheres rotatably mounted in a single circular pattern in a plate; and




c. orbiting the metal spheres around the metal closure to roll inwardly the sharp outer edge portion of the closure to produce a smooth edge on the closure that does not protrude outwardly or inwardly.

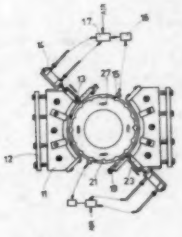
---

**4,369,644**

## HIGH SPEED TWO TRAVELS THREAD ROLLING MACHINE

**Chen Min-Chin, and Chen Tung-Chen, both of No. 150, Li Te St., Taichung City, Taiwan**

**Continuation of Ser. No. 965,415, Dec. 1, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,639**
**Int. Cl.³ B21H *3/02***
**U.S. Cl. 72—92** **8 Claims**




1. A planetary rolling machine for forming screw threads on work piece blanks comprising in combination:

a substantially disc-shaped central rotary die having a thread forming surface on a side face thereof,

at least one stationary segment die having a thread forming surface spaced from but proximate to said rotary die so as to allow passage of blanks between said side face of said rotary die and said thread forming surface on said stationary die,

a feeder holder proximate to an inlet area between said stationary die and said rotary die and a discharge area proximate to a terminal portion of said stationary die remote from said inlet area,

means for actuating said feeding holder,

cam means fixedly mounted on said rotary die for rotation therewith,

normally inoperative switch means for controlling said feeding holder actuating means,

said switch means including a microswitch for periodic engagement by portions of said cam means during the rotation of said rotary die at each of plural starting points for actuation of said feeding holder,

said cam means being arranged to operatively condition said switch means periodically during the rotation of said rotary die corresponding to the starting points of a threading operation on said blanks for actuation of said feeding holder to feed a blank, into said inlet area,

and time adjusting means for altering the control between said switch and said feeding holder actuating means while the machine is running.

---

**4,369,645**

## METHOD AND APPARATUS FOR COOLING WIRE ROD

**Hans Brauer, Leichlingen, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Company, Hilden, Fed. Rep. of Germany**

**Filed Jun. 25, 1980, Ser. No. 162,954**
**Int. Cl.³ B21B *43/00, 45/02;* C21D *1/62, 9/52***
**U.S. Cl. 72—201** **8 Claims**

1. In a cooling section for cooling hot-rolled wire, in which a tubular initial cooling section segment that plays a cooling liquid on the stretched wire is provided beyond a last roll stand of a multiple stand finishing roll block, each of said roll stands defining a work passage axis between working rolls thereof, the said cooling section segment sloping downwardly from said last roll stand, the improvement comprising that, in addition to the initial cooling section segment, said passage axes of all roll stands making up the finishing block are also inclined downward in line with respect to the horizontal by substantially the same angle of inclination as the following cooling section segment.

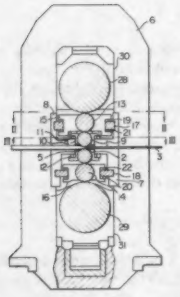
---

**4,369,646**

## ROLLING MILL AND METHOD FOR ROLLING A SHEET MATERIAL

**Toshiyuki Kajiwara, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 29, 1980, Ser. No. 191,911**
**Claims priority, application Japan, Oct. 4, 1979, 54-128732**
**Int. Cl.³ B21B *29/00***
**U.S. Cl. 72—243** **18 Claims**



1. A rolling mill comprising:
a pair of work rolls of low rigidity performing rolling of a material to be rolled by contact therewith;
a pair of intermediate rolls positioned vertically outwardly of the respective work rolls in contact therewith, said pair of intermediate rolls each having a diameter greater than that of said work rolls;
a pair of back-up rolls supporting the respective intermediate rolls;
means for axially displacing each of said intermediate rolls to position the end portion of the roll barrel thereof on or near a vertical lateral end surface of the rolled material to compensate for a deflection caused by a rolling force at one portion of a respective one of said work rolls; and
means for applying to each of the intermediate rolls a bending force to compensate for a deflection caused by the rolling force at the other portion of the respective one of said work rolls so that the shape of the rolled material can be controlled by the combination of adjustments of the axial position of the intermediate rolls and application of an intermediate roll bending action.

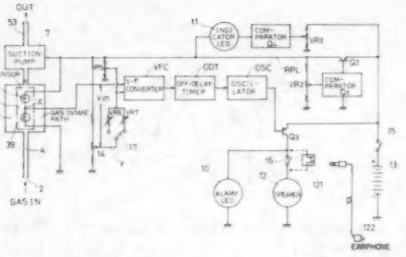
---

**4,369,647**

## GAS LEAKAGE DETECTOR

**Tesshi Shigemori, Nishinomiya; Yoshinao Nozawa, Suita; Teruhisa Kojima, Kawasaki, and Satoshi Kitajima, Hiratsuka, all of Japan, assignors to New Cosmos Electric Company Limited, Osaka, Japan**

**Filed Mar. 21, 1980, Ser. No. 133,650**
**Int. Cl.³ G08B *17/10;* G01N *31/00***
**U.S. Cl. 73—27 R** **32 Claims**




1. A gas leakage detector comprising:
a solid state gas sensor having a sintered metallic oxide block which changes its thermal conductivity with chemical adsorption thereto and a wire for transforming changes of thermal conductivity into a gas sensor electrical signal,
a gas intake path for conducting gas to said gas sensor,
a suction pump for drawing gas through the intake path to said gas sensor,
a voltage-frequency converter (VFC) for providing a pulse output frequency that is a function of the gas sensor electrical signal, and
an alarm indicator including sound and/or light controlled to pulsate in response to said VFC,
wherein the sound and/or light of said alarm indicator is controlled to pulse in a manner that the frequency of pulsation changes between a predetermined lower limit which corresponds to a lower limit of concentration of gas to be detected and a predetermined higher limit which corresponds to a higher level of concentration of gas to be detected, the time duration of each pulsation of light and/or sound being uniform regardless of any change of pulsation frequency, the light and sound being continuous at said higher limit.

---

**4,369,648**

## TESTING METHOD FOR DETERMINING THE MAGNETIC PROPERTIES OF FERROMAGNETIC POWDERS

**Karlheinz Uhle, Brühl, and Horst Krämer, Hürth-Hermülheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

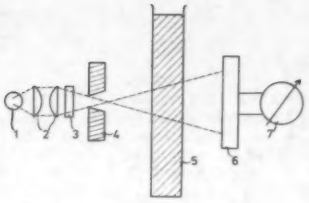
**Filed May 8, 1981, Ser. No. 261,744**
**Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018640**
**Int. Cl.³ G01N *15/04***
**U.S. Cl. 73—61.4** **2 Claims**

1. A method permitting ferromagnetic powders to be readily

tested for their qualification for use in heavy medium suspensions for the float-sink dressing of minerals, which comprises:

(a) admixing ferromagnetic powder particles with a size within the range 63 to 100μ with a quantity of a glycerol/-water mixture necessary to obtain a heavy medium suspension having a specific density within the range 1.45 to 1.55 g/cm$^3$; and subjecting the suspension to the following three magnetic operations comprising:

(b) demagnetizing the heavy medium suspension in a cyclicly decreasing alternating field at maximum field strengths within the range 1200 to 1600 amperes/cm and determining its relative sedimentation velocity by means of a sedimentometer;




(c) magnetizing the demagnetized heavy medium suspension in a magnetic steady field at field strengths within the range 700 to 900 amperes/cm and determining its relative sedimentation velocity by means of a sedimentometer; and

(d) demagnetizing the magnetized heavy medium suspension in a cyclicly decreasing alternating field at maximum field strengths within the range 1200 to 1600 amperes/cm and determining its relative sedimentation velocity by means of a sedimentometer; the ferromagnetic powder being fully serviceable for use in heavy medium suspensions in the event of the relative sedimentation velocity determined in step (b) being smaller than 0.25 cm/second, that determined in step (c) being greater than 2.5 cm per second and that determined in step (d) being smaller than 0.4 cm/second.

---

**4,369,649**

## TESTING METHOD FOR DETERMINING THE MAGNETIC PROPERTIES OF FERROMAGNETIC POWDERS

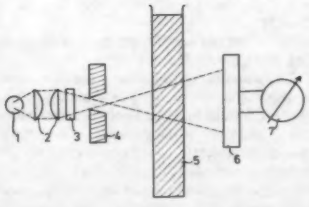
**Karlheinz Uhle, Brühl, and Horst Krämer, Hürth-Hermülheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed May 8, 1981, Ser. No. 261,769**

**Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018639**

**Int. Cl.$^3$ G01N *15/04***

**U.S. Cl. 73—61.4** **2 Claims**




1. A method permitting ferromagnetic powders for use in heavy medium suspensions for the float sink dressing of minerals to be tested as to their efficiency in magnetic separation and demagnetization, which comprises:

(a) removing a heavy medium suspension specimen from the purification cycle directly downstream of the magnetic separation stage, freeing the specimen from impurities by decantation, and determining the relative sedimentation velocity with the aid of a sedimentometer;

(b) removing a heavy medium suspension specimen from the purification cycle downstream of the demagnetization stage, freeing the specimen from impurities by decantation, and determining its relative sedimentation velocity with the aid of a sedimentometer; and

(c) demagnetizing the heavy medium suspension specimen according to (b) in a cyclicly decreasing magnetic alternating field with a maximum field strength which is 1.1 to 1.5 times the maximum field strength of the magnetic separator, and determining the relative sedimentation velocity of the specimen with the aid of a sedimentometer,

the ferromagnetic powder being reliably separable magnetically and demagnetizable with the aid of a demagnetizing means in the event of the relative sedimentation velocity according to (a) being at least ten times greater than the relative sedimentation velocity according to (b), and the relative sedimentation velocity according to (c) being at most 10% lower than that according to (b).

---

**4,369,650**

## ADJUSTABLE AIR FLOW SENSOR ARRANGEMENT

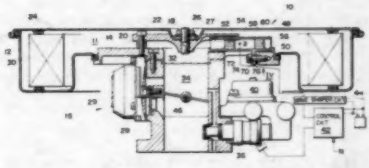
**Tadahiro Yamamoto, Yokosuka, and Kenji Masaki, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Nov. 21, 1980, Ser. No. 209,186**

**Claims priority, application Japan, Nov. 22, 1979, 54-161096[U]**

**Int. Cl.$^3$ G01M *15/00***

**U.S. Cl. 73—118** **4 Claims**



1. In an internal combustion engine having a combustion chamber and an induction passage leading from the ambient atmosphere to said combustion chamber,

an air flow sensor comprising:

a duct in said induction passage, said duct having an inlet and an outlet and through which flows a fraction of the total intake air received via said induction passage;

flow velocity increasing means for locally increasing the rate of flow of the air passing through said induction passage to create a pressure gradient zone; and

an adjusting device for varying the fraction of the total intake air permitted to flow through said duct, said adjusting device including a mechanism for moving said duct within said pressure gradient zone to vary the pressure differential across the inlet and outlet of said duct.

**4,369,651**

## NON-CONTACTING MULTI-FUNCTION SENSOR ARRANGEMENT

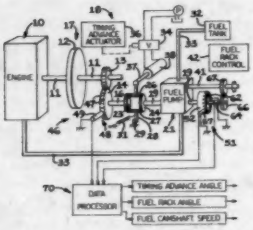
**John F. Szentes, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US81/00267, § 371 Date Mar. 3, 1981, § 102(e) Date Mar. 3, 1981, PCT Pub. No. W082/03124, PCT Pub. Date Sep. 16, 1982**

**PCT Filed Mar. 3, 1981, Ser. No. 278,498**

**Int. Cl.³ G01M *15/00***

**U.S. Cl. 73—119 A** **21 Claims**




1. In a system having first and second rotatable shafts (16,19), timing means (18) for rotatably driving one (19) of said shafts by the other (16) and for varying the angular relationship between said shafts (16,19), drive means (17) for rotating said shafts (16,19) at a selectable speed of rotation, the improvement comprising:

at least one first sensible member (47) rotatable at a speed constantly proportional to the speed of said first shaft (16) and movable through a first circular path;

a first signal generator means (48) for generating a first signal (71) in response to movement of said first sensible member (47) past a predetermined point (49) in said first circular path;

at least one second sensible member (53) rotatable at a speed constantly proportional to the speed of said second shaft (19) and movable through a second circular path;

a second signal generator means (51) for generating a second signal (72) in response to movement of said second sensible member (53) past a predetermined point (59) in said second circular path;

clock means (76) for generating a series of clock pulses; and

counting means (78,79) for counting the number of said clock pulses occurring in the interval beginning with a signal (72) from one (51) of said first and second signal generator means (48,51) and ending with the next succeeding signal (71) from the other (48) of said first and second signal generator means (48,51).

---

**4,369,652**

## METHOD FOR MEASURING THE VOLUME OF SOLID BODIES AND A MEASURING AND/OR REFERENCE CHAMBER FOR PERFORMING SAID METHOD

**Bertus L. Gundlach, Wageningen, Netherlands, assignor to De Rijkslandbouwhogeschool, Wageningen, Netherlands**

**PCT No. PCT/NL80/00020, § 371 Date Feb. 3, 1981, § 102(e) Date Feb. 3, 1981, PCT Pub. No. WO80/02639, PCT Pub. Date Dec. 11, 1980**

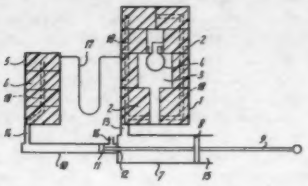
**PCT Filed Jun. 5, 1980, Ser. No. 233,591**

**Claims priority, application Netherlands, Jun. 5, 1979, 7904400**

**Int. Cl.³ G01F *17/00***

**U.S. Cl. 73—149** **9 Claims**

1. Method for measuring the volume of solid bodies by plethysmometry, i.e. by measuring the change in pressure caused by changing the volume to a predetermined known extent of a chamber in which the bodies to be measured are taken up, and which is closed from the surroundings, characterized in that, apart from the body to be measured the space within the chamber is filled for at least a major part thereof



with a solid filler material having a plurality of interconnected cavities.

---

**4,369,653**

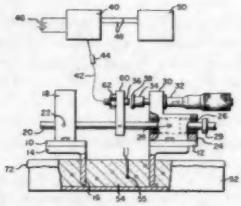
## SHRINKAGE GAUGE AND METHOD

**Bernard M. Closek, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Apr. 6, 1981, Ser. No. 251,990**

**Int. Cl.³ G01N *33/38, 33/34***

**U.S. Cl. 73—150 R** **9 Claims**



1. A shrinkage gauge comprising:

an elongated bridge member;

a pair of dependent blades, one fixed, the other slidable with respect to said bridge member;

means releasably locking said slidable blade with respect to the bridge member with the blades a set distance apart;

a proximity transducer fixedly attached to the bridge member; and

a target attached to said slidable blade, said transducer having a probe tip spaced from and aligned with said target, said blades being in substantial parallelism and adapted for insertion in poured cementitious materials.

---

**4,369,654**

## SELECTIVE EARTH FORMATION TESTING THROUGH WELL CASING

**Bobby J. Hallmark, 158 Afton Rd., Fort Worth, Tex. 76134**

**Filed Dec. 23, 1980, Ser. No. 219,865**

**Int. Cl.³ E21B *49/00***

**U.S. Cl. 73—151** **20 Claims**

1. A method of testing earth formation through the wall of a well casing, comprising the steps of:

(a) placing a formation testing means within said well casing at a position adjacent the earth formation to be tested;

(b) establishing a fluid tight seal between the interior face of said casing and said testing means to permit fluid pressure and flow communication solely between said interior face and the interior of said testing means;

(c) providing a designated potential fluid pressure change from within said testing means to said interior face which becomes an actual pressure change when said seal proves to be actually fluid tight;

(d) releasing a pressure responsive firing means in response

to said actual pressure change to actuate a casing perforating means;

(e) perforating a hole through said casing and into said

formation at a position surrounded by said fluid tight seal to establish fluid communication solely between said formation and the interior of said testing means; and

(f) testing said earth formation through said hole.

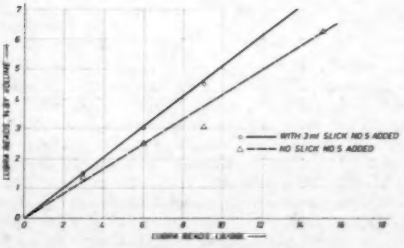
---

**4,369,655**

## METHOD OF DETERMINING THE CONCENTRATION OF SOLID LUBRICANTS IN DRILLING FLUIDS

**Forest A. Scearce, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.**

**Filed Dec. 12, 1980, Ser. No. 215,677**
**Int. Cl.³ E21B *47/00***
**U.S. Cl. 73—153** **13 Claims**




1. A method for determining the concentration of spherical solids used as a lubricant in a drilling fluid comprising:

(a) adding a liquid to a given volume of said drilling fluid;

(b) agitating the mixture of said drilling fluid and said liquid;

(c) passing the mixture of said drilling fluid and said liquid through a sieve of smaller mesh size than said spherical solids;

(d) removing said spherical solids and any other solids from said sieve;

(e) mixing said mixture of said spherical solids and said other solids with a wetting agent for said spherical solids;

(f) permitting said mixture of said spherical solids and said other solids to settle in a graduated measuring means; and

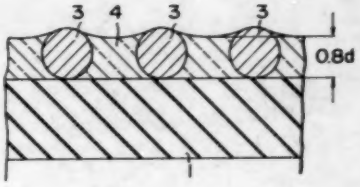
(g) determining the volume of said spherical solids contained in said given volume of said drilling fluid.

**4,369,656**

## AIR INTAKE MEASURING DEVICE FOR INTERNAL COMBUSTION ENGINE

**Sadayasu Ueno; Kanemasa Sato; Yoshishige Oyama; Yutaka Nishimura, and Kazuhiko Miya, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 2, 1981, Ser. No. 230,804**
**Claims priority, application Japan, Jan. 31, 1980, 55/11344**
**Int. Cl.³ G01F *1/68***
**U.S. Cl. 73—204** **7 Claims**




1. An air intake measuring device of a fuel supply system of an internal combustion engine for supplying a fuel of an amount commensurate with the flow rate of air drawn into the internal combustion engine, comprising:

an air flow rate sensor element, such air flow rate sensor element comprising:

a support formed of a ceramic electric insulating material;

a platinum resistor wire, the characteristic of which depends on temperature, wound on said support in convolutions;

and a signal equalizing member formed of lead glass uniformly applied as a coating on only a portion of the surface of said resistor wire in such a manner that a part of the surface of the resistor wire is exposed, while the rest thereof is covered with the coating of the signal equalizing member, said signal equalizing member rigidly securing the resistor wire to said support.

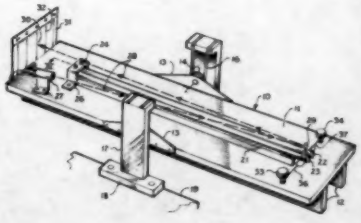
---

**4,369,657**

## GRAVIMETER

**Samuel T. Alexander, 272 Morada La., Santa Barbara, Calif. 93105**

**Continuation-in-part of Ser. No. 108,487, Dec. 31, 1979, abandoned. This application Jul. 21, 1981, Ser. No. 285,592**
**Int. Cl.³ G01V *7/04***
**U.S. Cl. 73—382 R** **7 Claims**



1. A gravimeter comprising:

(a) a table movable from a horizontal to a vertical position;

(b) a pair of elastic rods of dissimilar material disposed parallel to each other on the table;

(c) means for supporting adjacent ends of the rods when the table is rotated to a vertical position;

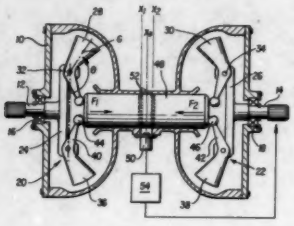
(d) and means for measuring the differential change in length of the rods at the other ends of the rods as the table is rotated from a horizontal to a vertical position.

**4,369,658**

## DEVICE FOR DETECTING DIFFERENCES IN THE SPEEDS OF ROTATION OF TWO SHAFTS

**Jean-Max M. Silhouette, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France**

**Filed Oct. 16, 1980, Ser. No. 197,528**
**Claims priority, application France, Oct. 16, 1979, 79 25647**
**Int. Cl.³ G01P *3/04*; F02D *25/02*; G05D *13/62***
**U.S. Cl. 73—507** **8 Claims**



1. A device for detecting a differential angular velocity between a first and a second revolving shaft comprising:

a first dead-head system for producing a first centrifugal force at a first angular velocity and a first tension operatively associated with said first shaft,

a second dead-head system for producing a second centrifugal force at a second angular velocity and a second tension operatively associated with said second shaft and disposed opposite said first dead-head system;

a movable body disposed between and operatively associated with said first and said second dead-head systems such that said first and said second centrifugal forces are opposingly applied to said movable body and wherein a sum of said first tension and said second tension is negative such that a displacement of said movable body is representative of said differential angular velocity.

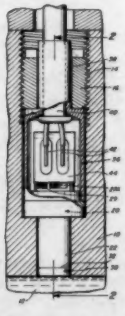
---

**4,369,659**

## PRESSURE TRANSDUCER

**William M. Wareham, Marion, Mass., assignor to Bofors America, Inc., Norwood, Mass.**

**Filed Aug. 11, 1980, Ser. No. 176,863**
**Int. Cl.³ G01L *9/04*, *19/04***
**U.S. Cl. 73—708** **12 Claims**



1. A pressure transducer comprising;

a frame having an elongated bore therein extending from one end of the frame to another sensing end,

a filler rod in the elongated bore and dimensioned in comparison with the bore dimensions to provide a minimum volume,

a diaphragm closing the one end of the frame and defining with the frame a compartment in communication with the bore,

a liquid filled deformable sensor defined at the sensing end of the frame including a reduced thickness wall surrounded by thicker wall portions and sensing means at the reduced thickness wall for sensing deformation of the diaphragm,

and a liquid filling the transducer for applying pressure exerted against the diaphragm to the sensing means,

said filler rod extending substantially the entire length of said bore from said liquid filled deformable sensor to the diaphragm defined compartment,

said diaphragm defined compartment being thin and disc-shaped and also defined by at least an end of the filler rod,

said filler rod being constructed of a material having a low temperature coefficient of expansion in comparison to that of the liquid fill and said filler rod extending from said sensing end of the frame to the diaphragm compartment,

said filler rod in combination with a close tolerance bore in the frame providing a small internal liquid volume.

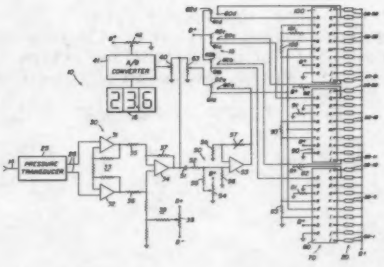
---

**4,369,660**

## ELECTRONIC PRESSURE MEASURING APPARATUS

**Richard P. Lentz; Thomas J. Lasky, both of Kenosha, and Stephen B. Servais, Franksville, all of Wis., assignors to Snap-On Tools Corporation, Kenosha, Wis.**

**Filed Apr. 13, 1981, Ser. No. 253,582**
**Int. Cl.³ G01L *9/04***
**U.S. Cl. 73—753** **12 Claims**



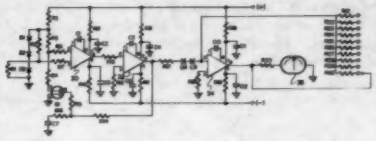

1. Electronic pressure measuring apparatus for measuring the pressure in a chamber, comprising a pressure transducer adapted to be coupled to the chamber for generating a composite electrical signal having an amplitude related to the magnitude of the pressure in the chamber, the composite electrical signal having a DC component and an AC component, means for converting the composite electrical signal into digital signals, means for displaying digits corresponding to the digital signals, means for passing only the AC component of the composite electrical signal, driver means being operable in first and second modes and having an input and a plurality of outputs respectively corresponding to a plurality of amplitudes of an electrical signal applied to said input, said driver means in the first mode thereof being constructed and arranged to produce an energizing current on all of said outputs up through the output corresponding to the amplitude of an electrical signal applied to said input, said driver means in the second mode thereof being constructed and arranged to produce an energizing current on only the one of said outputs corresponding to the amplitude of the electrical signal, means for coupling the composite electrical signal to said driver means when in the first mode thereof and for coupling the AC component to said driver means when in the second mode thereof, and a plurality of separate lights respectively coupled to said outputs and being illuminated in the presence of energizing currents.

4,369,661

## AUTOMATIC NULLING CIRCUIT FOR TRANSIENT PRESSURE RATE CHANGES

Owen L. Gibb, 2218 Clark La., Redondo Beach, Calif. 90278

Filed Aug. 15, 1980, Ser. No. 178,619
Int. Cl.³ G01L 21/12
U.S. Cl. 73—755 10 Claims



1. In a pressure sensing apparatus having means for generating an electrical signal corresponding in magnitude to a sensed pressure, the improvement comprising means for isolating and detecting short term transient disturbances in the rate of change of the sensed pressure, said means comprising:

an adjustable reference circuit establishing an adjustable reference signal,

a comparison circuit for comparing the pressure signal with the reference signal and for producing an output signal representative of the differential between the compared signals, and

a feedback circuit having a response time which together with the response time of the comparison circuit introduces an overall response time which is greater than substantially the duration of the transient disturbance sought to be detected, said feedback circuit being connected from the output of the comparison circuit to the adjustable reference circuit to adjust the reference signal to a predetermined relationship with respect to the pressure signal, as delayed by said overall response time,

whereby substantially constant rates of pressure change appear as steady state signals at the output of the comparison circuit and short term transient deviations from said constant rates appear at the output of the comparison circuit as deviations from said steady state signals.

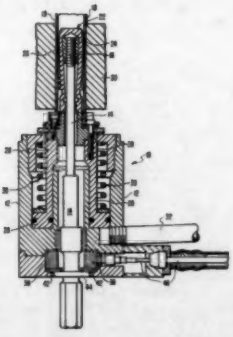
---

4,369,662

## PLUG INSTALLATION APPARATUS

Stuart L. Rieben, Pittsburgh; John J. Wilhelm, New Kensington, and Mark E. Wylie, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1981, Ser. No. 238,260
Int. Cl.³ G01L 5/00
U.S. Cl. 73—862.01 9 Claims



1. A plug installation apparatus including a housing with a slider member disposed therein, a rod slidably disposed in said slider member and means for moving said rod relative to said slider member for expanding a plug in a tube, the improvement comprises:

a contact member disposed on said slider member for contacting the end of said tube; and

switch means mounted on said contact member and arranged to contact said slider member for indicating that said contact member has been moved relative to said slider member.

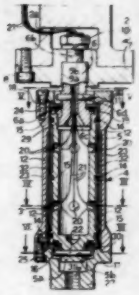
---

4,369,663

## TRANSDUCER WITH SIX DEGREES OF FREEDOM

Giorgio Venturello, and Osvaldo Salvatore, both of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Feb. 3, 1981, Ser. No. 231,065
Claims priority, application Italy, Mar. 7, 1980, 67359 A/80
Int. Cl.³ G01L 5/16
U.S. Cl. 73—862.04 8 Claims



1. A transducer having six degrees of freedom, for converting the forces and moments applied to a movable member, particularly to the movable arm of a robot, into electrical signals, said transducer comprising

a rigid body of substantially cylindrical form intended to be connected to the said movable member, said body having a lateral surface which comprises a first and a second axial portion;

a respective set of four metal plates provided on each of said first and second axial portions of said body, the plates of each set being equi-angularly spaced around the body and being arranged diametrically opposite one another in pairs, the generatrices of the said lateral surface which are tangential to each plate carried by the said first axial portion of the said surface, being tangential to a corresponding plate carried by the said second portion;

a rigid casing having a substantially cylindrical inner surface which surrounds the said body;

resilient spacer means resiliently mounting said casing on the said body in such a way that the casing can perform limited displacements with six degrees of freedom with respect to the body;

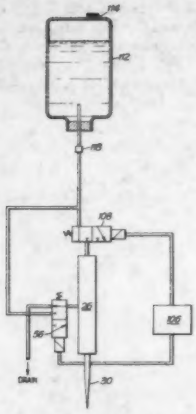
two substantially semi-cylindrical equi-angularly spaced metal plates provided on the inner surface of said casing, said semi-cylindrical plates being positioned facing the plates carried by the said body in such a way as to define therewith a narrow interspace and to constitute eight capacitors the capacitances of which depend on the relative positions between the plates of the casing and the plates of the body; and

detector means connected to the said capacitors for measuring, in use, the instantaneous values of the capacitance of each of the said capacitors and for providing, on the basis of this measurement, electrical signals indicative of the forces and the moments applied to the said movable member.

## 4,369,664
## PIPETTE MEANS

Roger A. Bunce, Bourneville; John E. C. Gibbons, Stirchley, and Larry J. Kricka, Bourneville, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 24, 1980, Ser. No. 200,583
Claims priority, application United Kingdom, Oct. 31, 1979, 7937750
Int. Cl.³ B01L 3/02
U.S. Cl. 73—864.12 6 Claims



1. Pipette means having aspirating and expelling means and a substantially cylindrical tube connected to a pipette tip for fluid flow therebetween; the expelling means being arranged to apply pressure to the outer surface of the cylindrical tube, the diameter and wall thickness of which being chosen so that said tube is compressed elastically and substantially uniformly and circumferentially to reduce the internal volume thereof, tending to expel any liquid from the pipette tip; and the aspirating means being arranged to relieve pressure from the outer surface of said tube, allowing the tube to expand substantially circumferentially and uniformly so that liquid may thereby be drawn into the pipette tip; the said expelling and aspirating means operating the application and relief respectively of fluid pressure to and from the cylindrical tube; said pipette means also having means for diluting a sample including diluent valve means for permitting a controlled amount of liquid diluent to pass through the cylindrical tube to the pipette tip to dilute a sample when the expelling means applies pressure to the cylindrical tube and wherein the source of fluid pressure is the source of liquid diluent arranged as a head tank at a level about the cylindrical tube great enough to provide pressure adequately to compress the cylindrical tube.

---

## 4,369,665
## MANUALLY HOLDABLE AUTOMATIC PIPETTE

Paul S. Citrin, Danbury, Conn., assignor to Indicon Inc., Brookfield Center, Conn.

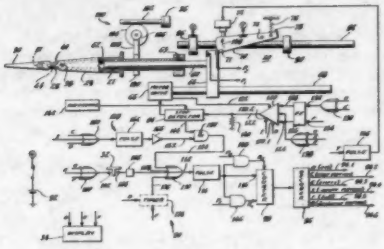
Continuation of Ser. No. 868,687, Jan. 11, 1978, abandoned. This application Apr. 25, 1979, Ser. No. 33,044
Int. Cl.³ B01L 3/02
U.S. Cl. 73—864.18 28 Claims

1. An automatically operable pipette for taking up and discharging liquid comprising:

a main housing having a liquid flow control port at one end to control the flow of liquid, said main housing being shaped to be conveniently held in a single hand;

displacement means mounted in the main housing and having a variable displacement volume in fluid communication with the liquid flow control port of the main housing to produce cycles of take-up and discharge of fluid through said port; said displacement means including a cylinder in fluid communication with the liquid flow control port and a piston operatively mounted for intake and discharge strokes in the cylinder to vary the volume therein for the control of the intake and discharge of liquid, said cylinder having an effective length selected to enable said piston to move a distance which is substantially greater than the normally effective range of a finger actuated motion of a piston for a pipette, said cylinder having a crossectional area which is selected sufficiently small to significantly enhance the accuracy of the pipette for relatively small displacement volumes;

motor means mounted in said main housing and operatively



coupled to said piston to drive the piston through fluid intake and fluid discharge cycles; and

control means mounted in said main housing to control operation of said motor means through the fluid intake and fluid discharge cycles of the displacement means and cause said piston to be moved between precisely defined intake positions, said control means including:

i. first stop means for precisely defining the initial position of the piston at the beginning of the intake stroke of the piston;

ii. second stop means for precisely defining the position of the piston at the end of the intake stroke; and

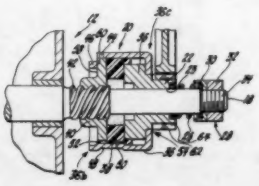
iii. means for varying the operative location of said second stop means to correspondingly vary the stroke length of the piston to form a variable volume pipette.

---

## 4,369,666
## STARTER DRIVE ASSEMBLY

Calvin V. Kern, Maumee, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Nov. 19, 1980, Ser. No. 208,367
Int. Cl.³ F02N 15/06; B21D 39/00
U.S. Cl. 74—7 R 10 Claims



1. A starter motor pinion gear assembly comprising:

a cylindrical cup having a first closed end and a second open end;

said first end defining an opening therethrough, said opening having a periphery in the shape of an endwise profile of a pinion gear and being adapted to receive a pinion gear therethrough;

a spline follower positioned within said cup and defining a spline opening therethrough;

a pinion gear positioned within said cup and having teeth projecting radially outward from a bottom land and having intertooth fillets projecting radially outward from said bottom land at one end thereof;

said teeth being disposed through said opening, and said intertooth fillets being disposed within said cup to retain said gear in said cup;

a resilient means interposed between said gear and said spline follower;

said cup having a plurality of circumferentially-spaced portions adjacent said second open end being displaced radially inward adjacent a surface of said spline follower distant to said resilient means;

said circumferentially-spaced displaced portions forming retaining step portions for entrapping said spline follower in alignment with said pinion gear;

said spline follower including a plurality of grooves defined in a periphery of said spline follower, said grooves being aligned with an axis of said cylindrical cup;

said cup defining a plurality of depressions in an outer periphery thereof, each said depression defining protrusions from an inner periphery of said cup;

said protrusions and said grooves being adapted to cooperate to restrain said spline follower from rotation with said cup;

said spline opening of said spline follower being a helically spline opening;

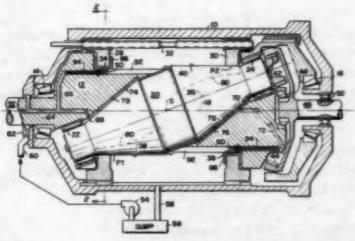
said cylindrical cup defining a plurality of notches, each said notch being disposed adjacent one said displaced portion for allowing said portion to be displaced without shearing the material of said cylindrical cup.

---

## 4,369,667
## TRACTION SURFACE COOLING METHOD AND APPARATUS

**Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.**

**Filed Jul. 10, 1981, Ser. No. 282,233**
**Int. Cl.³ F16H** *15/16, 57/04, 15/50*
**U.S. Cl. 74—191** **15 Claims**



1. In a traction drive torque transmission having a closed housing, an alpha body supported in said housing for rotation about a first axis, a beta body supported for relative rotation from said alpha body on a second axis inclined with respect to and intersecting said first axis at a point of axes intersection, said beta body defining a pair of conical traction surfaces concentric with said second axis, one on each side of said point of axes intersection, a pair of rings defining inside traction surfaces of revolution about said first axis and shiftable axially toward and away from each other, said conical traction surfaces being in rolling friction engagement with said inside traction surfaces at two diametrically opposite points of contact, the improvement comprising:

means carried rotatably by said alpha body to define clearance spaces extending arcuately through a defined sector of and adjacent to each said conical traction surfaces and said inside traction surfaces, respectively; and

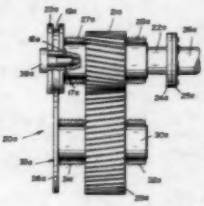
means for circulating a traction lubricant through both of said clearance spaces.

---

## 4,369,668
## AXIAL THRUST COMPENSATION SYSTEM

**Erich Pollak-Banda, and Erich John, both of Augsburg, Fed. Rep. of Germany, assignors to Zahnradfabrik Renk A.G., Augsburg, Fed. Rep. of Germany**

**Filed Jun. 9, 1980, Ser. No. 157,441**
**Claims priority, application Fed. Rep. of Germany, Jun. 16, 1979, 2924349**
**Int. Cl.³ F16H** *1/08, 1/20*
**U.S. Cl. 74—414** **11 Claims**



1. In a gearing assembly comprising two gears in engagement, a pair of gear shafts, each gear being secured to a shaft, the improvement comprising an axial thrust compensation system, the system including disc means projecting from one of the shafts, the disc means being fixed to the one shaft against axial displacement, the other shaft including thrust collar means for accommodatingly receiving the disc means, threaded securement means coaxial with the other shaft for fixing the thrust collar means to the other shaft against axial displacement, a side surface of the disc means engaging the thrust collar means for transfer of forces in an axial direction therebetween and for restraining axial displacement of the disc means relative to the thrust collar means, the periphery of the disc means being free of engagement with the thrust collar means, the gearing assembly further including a pair of journal bearings associated with each shaft, a zone of each shaft on opposite sides of its respective gear being received within a journal bearing, one journal bearing being positioned between the disc means and the gear secured to the one shaft and another journal bearing being positioned between the thrust collar means and the gear secured to the other shaft, whereby high speed gear engagement may be maintained and axial thrust compensated while shaft fixture is minimized.

---

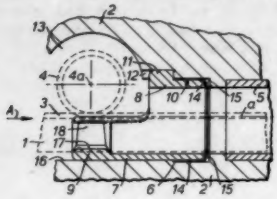
## 4,369,669
## RACK AND PINION ASSEMBLY

**David H. Allen, Yatton, England, assignor to Cam Gears Limited, Hitchin, England**

**Filed Jul. 23, 1980, Ser. No. 171,349**
**Int. Cl.³ F16H** *19/04;* **B62D** *3/12*
**U.S. Cl. 74—422** **12 Claims**

1. A rack and pinion assembly comprising a housing, a rack bar having a longitudinally extending axis and being longitudinally displaceable in said housing, a pinion rotatably mounted in said housing and having its teeth in engagement with the teeth of said rack bar so that rotation of said pinion effects a longitudinal displacement of said rack bar relative to said housing, a bearing member located between said rack bar and said housing, said bearing member having a tubular retaining portion through which the rack bar is longitudinally displaceable and a bearing portion extending longitudinally from said tubular retaining portion, the length of said bearing portion measured along the rack bar axis being less than the length of

said retaining portion measured along the rack bar axis, said bearing portion slidably supporting said rack bar to maintain the teeth of said rack bar in engagement with the teeth of said pinion, said tubular retaining portion being spaced from said rack bar, said bearing portion being located between said rack bar and said housing on the side of said rack bar remote from said pinion and opposite to the region of engagement between the teeth of said rack bar and pinion, and means carried on said tubular retaining portion and cooperating with respective means in said housing for retaining said bearing member from longitudinal and rotational displacement relative to said housing.



---

4,369,670

## MULTI-LINK DRIVE PEDAL OF PLASTIC MATERIAL

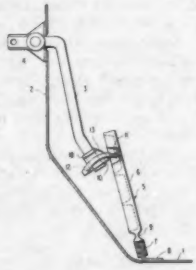
Dieter Papenhagen, Backnang-Heiningen, and Norbert Komoschinski, Winnenden, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 177,059

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932671

Int. Cl.[3] G05G *1/14;* F16B *7/20*

U.S. Cl. 74—513 7 Claims



1. A multiple-link gas pedal for motor vehicles including a foot plate, a connecting means for enabling a connection of the gas pedal to a pivotable actuating lever, hinge means for articulatingly connecting the connecting means on a rear side of the foot plate in an area of an upper end thereof, mounting means for mounting the actuating lever to the connecting means, and a further hinge means for articulatingly connecting the mounting means to the connecting means, the mounting means includes a bore adapted to receive a free end of the actuating lever, characterized in that the bore is provided with at least one flaring portion, and in that a lower end of the actuating lever is provided with at least one projection having a shape corresponding to the flaring portion of the bore whereby, after an introduction of an end of the actuating lever into the bore and a mutual twisting between the actuating lever and the mounting means, the at least one projection rests on an underside of the mounting means along marginal zones of the bore which are not widened.

---

4,369,671

## TORQUE TRANSFER MECHANISM WITH HYDRAULIC CONTROL SYSTEM FOR A FOUR WHEEL DRIVE VEHICLE

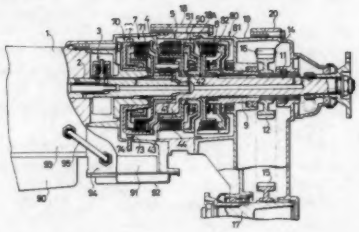
Goichi Matsumoto, Okazaki, and Yoichi Hayakawa, Toyoake, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Dec. 5, 1980, Ser. No. 213,715

Claims priority, application Japan, Dec. 12, 1979, 54-161339

Int. Cl.[3] B60K *17/34, 41/04*

U.S. Cl. 74—665 GA 18 Claims



1. A torque transfer mechanism for a four wheel drive vehicle having an automatic transmission, said torque transfer mechanism comprising:

an input shaft for receiving torque from said automatic transmission;

a first output shaft connected to one of front and rear drive axles of the vehicle;

a second output shaft connected to the other one of the drive axles;

speed reducer means for transmitting the rotation of said input shaft to said first output shaft at a reduced speed of said output shaft when said speed reducer is engaged;

means for nullifying the operation of said reducer means and directly coupling said input shaft with said first output shaft;

means engaging said reducer for speed reduction;

a mechanism for transmitting the rotation of said first output shaft to said second output shaft;

a hydraulic control system including:

a source of a first pressurized fluid;

first conduit means for supplying said first pressurized fluid to a first driving means, said first driving means selectively engaging said means for directly coupling and nullifying said reducer means operation;

second conduit means for supplying said first pressurized fluid to a second driving means, said second driving means selectively engaging and disengaging said means for engaging said reducer for speed reduction;

a source of a second pressurized fluid;

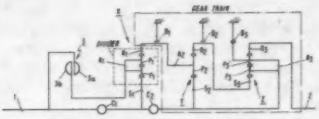
valve means for selectively connecting said first pressurized fluid to either said first or said second conduit means, said valve means being adapted to sense the pressure of said second fluid and connecting said first pressurized fluid to said second conduit means to engage and operate said reducer means only when said second pressurized fluid pressure falls below a predetermined level.

4,369,672

## CHANGE-SPEED TRANSMISSION WITH SELECTIVE BYPASS OF HYDROKINETIC UNIT

Kunio Obtsuka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 899,991, Apr. 25, 1978. This application Jun. 16, 1981, Ser. No. 274,292
Claims priority, application Japan, May 13, 1977, 52-54206
Int. Cl.³ F16H 47/08
U.S. Cl. 74—688 11 Claims



10. A change-speed transmission comprising:
an input member (1) to receive the input torque;
an output member (2) to provide the output torque;
a hydrokinetic unit (3) having a pump (3*a*) connected to said input member for simultaneous rotation therewith and a turbine (3*b*);
a first and a second clutch;
a divider in the form of a planetary gear set having at least a first, a second and a third rotary element;
a planetary gear train having at least a first, a second and a third rotary element;
said first rotary element of said divider being connected to said first rotary element of said gear train for simultaneous rotation therewith;
said second rotary element of said divider being connectable through said second clutch ($C_2$) to said second rotary element of said gear train for simultaneous rotation therewith when said clutch is engaged;
said output member (2) being connected to said third rotary element of said gear train for simultaneous rotation therewith;
said turbine being connected to said third rotary element of said divider for simultaneous rotation therewith; and
said input member being connectable through said first clutch ($C_1$) to said second rotary element of said divider for simultaneous rotation therewith so as to bypass said hydrokinetic unit when said clutch is engaged;
whereby upon engagement of said first clutch ($C_1$) the input torque of the input member may be split providing a portion of the input torque to the output member bypassing said hydrokinetic unit and providing the remaining portion of the input torque to the output member passing through said hydrokinetic unit, irrespective of the condition of said second clutch ($C_2$); and wherein
said planetary gear set (X) of said divider comprises:
a first sun gear ($S_1$) as said second rotary element of said divider;
a first ring gear ($R_1$) as said first rotary element of said divider; and
a first carrier ($A_1$) as said third rotary element of said divider, said first carrier rotatably carrying a plurality of pairs of intermeshing first pinions ($P_1$, $P_1'$), one of said intermeshing first pinions of each pair ($P_1$) meshing with said first sun gear ($S_1$), the other one of said intermeshing first pinions of each pair ($P_1'$) meshing with said first ring gear ($R_1$); in which said planetary gear train comprises:
a second planetary gear set (Y) which comprises
a second sun gear ($S_2$) as said second rotary element of said gear train;
a second ring gear ($R_2$); and
a second carrier ($A_2$) as said first rotary element of said gear train, said second carrier ($A_2$) rotatably carrying a plurality of second pinions ($P_2$), each meshing with both of said second sun gear ($S_2$) and second ring gear ($R_2$); and
a third planetary gear set which comprises
a third sun gear ($S_3$) connected to said second ring gear ($R_2$) for simultaneous rotation therewith;
a third ring gear ($R_3$) as said third rotary element of said gear train;
a third carrier ($A_3$) rotatably carrying a plurality of pairs of intermeshing third pinions ($P_3$, $P_3'$), one of said intermeshing third pinions of each pair ($P_3$) meshing with said third sun gear ($S_3$), the other one of said intermeshing third pinions of each pair ($P_3'$) meshing with said third ring gear ($R_3$), said third carrier ($A_3$) being connected to said second sun gear ($S_2$) for simultaneous rotation therewith; and, in which said planetary gear train further comprises
a first brake ($B_1$) operable to anchor said first ring gear ($R_1$) and second carrier ($A_2$);
a second brake ($B_2$) operable to anchor said second ring gear ($R_2$) and third sun gear ($S_3$); and
a third brake ($B_3$) operable to anchor said third carrier ($A_3$) and second sun gear ($S_2$).

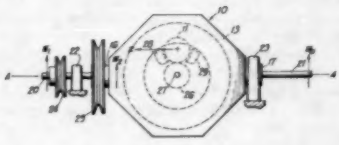
---

4,369,673

## MECHANICAL TORQUE CONVERTER

Eugene I. Odell, c/o Dept. of Mechanical Engineering, Univ. of South Alabama, Mobile, Ala. 36688

Filed Jun. 26, 1980, Ser. No. 163,227
Int. Cl.³ F16H 3/74, 37/06, 15/50
U.S. Cl. 74—751 20 Claims

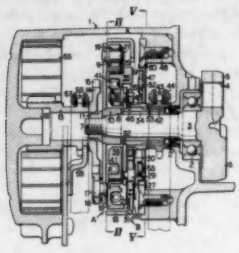


1. A gyroscopic traction drive assembly comprising, in combination:
a frame, a spherical gryroscopic mass carried by said frame and means for rotating said frame about a fixed axis whereby said mass is caused to rotate at an angular velocity $\omega_z$ about a first axis passing through the center of said mass;
traction input means and traction output means rotatably carried by said frame for engaging said gyroscopic mass at respective contact points which lie in a plane orthogonal to said fixed axis and which define, with the center of the mass, respective axes y and x which are orthogonal to each other;
means carried by said frame for positively locating said gyroscopic mass in fixed relation to said frame such that the center of said mass and said respective contact points remain in said plane and including roller means for engaging said mass at a third contact point lying in said plane to force said mass to bear upon said traction input and traction output means at said respective contact points;
means for causing said traction input means to impart to said mass an angular velocity $\omega_x$ about said x axis whereby said gyroscopic mass is caused to precess at an angular velocity $\omega_y$ about said y axis; and
said roller means causing said mass to bear upon said traction input and traction output means at said respective contact points with sufficient force such that said angular velocity $\omega_y$ imparts an output torque to said traction output means which is independent of the rotational speed of such traction output means.

## 4,369,674
## POWER TRANSMISSION DEVICE

Masumi Hamane, Kawagoe, and Makoto Kondo, Ooi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,620
Claims priority, application Japan, May 18, 1979, 54-61750
Int. Cl.³ F16H 3/74
U.S. Cl. 74—752 E 9 Claims

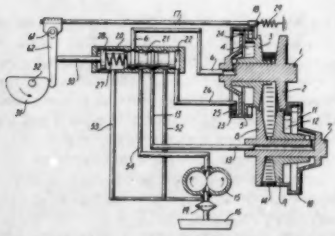


1. In a power transmission device for transmitting power from a drive shaft to a driven shaft by way of a planetary gear mechanism, said planetary gear mechanism having a ring gear, a sun gear disposed concentrically on the radially inner side of said ring gear, and planetary gears disposed between and engaged with said sun gear and said ring gear, the improvement comprising a pair of side plate means attached to said planetary gear mechanism for holding the meshing portions of said planetary gears, said ring gear and said sun gear from the opposite sides of the gears so as to permit free sliding movement of all of these gears relative thereto and, at the same time, acting to suppress relative axial movements of all of these gears, said side plate means serving to support at least one of said ring gear, said planetary gears and said sun gear, said side plate means being in sliding contact with only opposite side surfaces of all of the respective gears.

## 4,369,675
## METHOD AND APPARATUS FOR CONTROLLING AN INFINITELY VARIABLE TRANSMISSION OF A MOTOR VEHICLE

Petrus H. van Deursen, Deurne, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Continuation of Ser. No. 92,732, Nov. 9, 1979, abandoned. This application Dec. 11, 1981, Ser. No. 329,827
Claims priority, application Netherlands, Nov. 13, 1978, 7811192
Int. Cl.³ B60K 41/12; F16H 11/06
U.S. Cl. 74—864 5 Claims

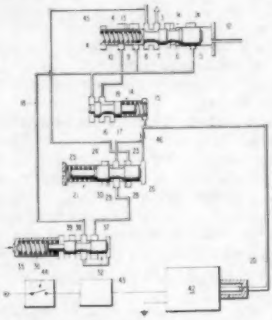


1. In apparatus for controlling the transmission ratio of an infinitely variable V-belt transmission having variable pitch input and output pulleys operable by hydraulic cylinders, each pulley being formed of a pair of conical discs, at least one of which is axially movable relative to the other disc of that pair and said input pulley being rotatably driven by a power source: a hydraulic control valve for operating said cylinders, said valve having an internal axially movable spool; means responsive to the speed of said input pulley for urging said spool in one direction; compression spring means urging said spool in an opposite direction, said spring means being loaded through intermediate connecting means movable by external loading means and additionally movable by additional loading means dependent on the actual transmission ratio.

## 4,369,676
## KICK-DOWN CIRCUIT FOR AUTOMATIC CHANGE-SPEED TRANSMISSIONS

Hermann Gaus, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 169,520
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929573
Int. Cl.³ B60K 41/10
U.S. Cl. 74—868 8 Claims

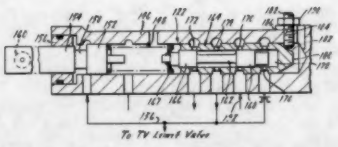


1. A kick-down circuit for an automatic change-speed transmission, the circuit including a kick-down control means for transmitting a kick-down control signal when an accelerator pedal of the vehicle in which the transmission is installed is depressed to a predetermined position, characterized in that means are provided for limiting a duration of the kick-down control signal for a predetermined time period independently of a position of the accelerator pedal.

## 4,369,677
## TRANSMISSION THROTTLE PRESSURE REGULATOR ASSEMBLY

Charles W. Lewis, Wayne, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 3, 1980, Ser. No. 165,883
Int. Cl.³ B60K 41/04
U.S. Cl. 74—869 6 Claims




1. In a control valve circuit for an automatic transmission having fluid pressure operated clutch and brake servos adapted to control the relative motion of gear elements of said transmission:

a throttle valve assembly comprising a valve body, a valve opening in said valve body;

a valve sleeve in said opening having a line pressure supply port, an exhaust port, a throttle valve pressure supply port and a throttle valve pressure feedback port;

a movable valve spool slidably disposed in said valve sleeve, said valve spool having spaced pressure regulating lands registering with said line pressure supply port and said exhaust port, said feedback port communicating with the interior of said sleeve at one end of said valve spool whereby the line pressure in said line pressure supply port is modulated;

a valve plunger in said opening, means for slidably positioning said plunger;

spring means between said plunger and the other end of said valve spool for exerting a variable force on said valve spool that is dependent upon plunger displacement;

and means for manually adjusting the position of said sleeve in said valve opening whereby the pressure modulating characteristic of said throttle valve assembly may be controlled.

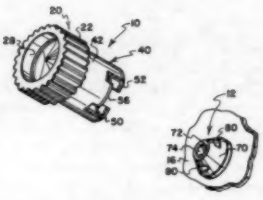
---

**4,369,678**

## TOOL AND OPERATOR HEAD FOR A TOOL-OPERATED LOCK

**Donald L. Cooper, and Gordon G. Zeidman, both of Columbus, Ohio, assignors to The Eastern Company, Cleveland, Ohio**

**Filed Oct. 22, 1980, Ser. No. 199,559**
**Int. Cl.³ B25B *13/00***
**U.S. Cl. 81—90 C** **7 Claims**




1. A tool and operator head for rotating a rotatable member, comprising:

(a) an operator head having an outer surface of truncated cone configuration, an end surface located near the smaller end of the truncated cone, and a pair of slots formed in opposite sides of the outer surface and defining a pair of parallel-extending driving surfaces at the bottoms of the slots;

(b) a tool including structure defining a pair of spaced, opposed driving means which are insertable into the slots for engaging the driving surfaces for drivingly connecting the tool and the head; and,

(c) detent means for releasably retaining the tool on the head including interfitting formation means on the tool and on the end surface which formation means are interfittingly engaged when the tool is drivingly connected to the head, and biasing means for biasing the interfitting formation means into engagement with each other.

---

**4,369,679**

## PORTABLE ROTARY MACHINING DEVICE

**Norman E. Jones, Box 124, Tracyton, Wash. 98393**

**Filed Nov. 12, 1980, Ser. No. 206,207**
**Int. Cl.³ B23B *3/24***
**U.S. Cl. 82—4 R** **4 Claims**

1. A rotary machining device comprising:

(a) a housing, a cutting tool, a vertical feed mechanism, a horizontal feed mechanism and a rotation drive mechanism;

(b) said vertical feed mechanism, said horizontal feed mechanism and said rotation drive mechanism mounted on and within said housing;

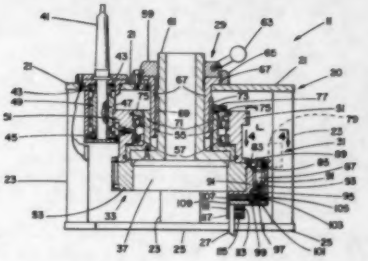
(c) said cutting tool mounted on said horizontal feed mechanism for imparting horizontal movement to said cutting tool;

(d) said vertical feed mechanism centrally mounted within said housing and supporting said horizontal feed mechanism for imparting vertical movement thereto;

(e) said rotational drive mechanism mounted on said periphery of said housing and operatively connected to said horizontal feed mechanism for imparting rotational movement thereto;

(f) whereby said cutting tool may be moved vertically, horizontally and rotationally to make circular cuts in material that is positioned outside of said housing;

(g) said housing includes a top plate, a base and legs;



(h) said top plate having a central opening, said base having a central opening and said legs interconnecting said top plate and said plate in a spaced apart relationship;

(i) said vertical feed mechanism includes a feed nut, and a vertical feed column;

(j) said vertical feed column having a central opening;

(k) said feed nut and said vertical feed column being in threaded engagement whereby rotation of said feed nut in one direction raises said vertical feed column and rotation in the other direction lowers said vertical feed column;

(l) said vertical feed mechanism includes a slip ring, said slip ring mounted on said top plate for rotationally supporting said feed nut; and

(m) said vertical feed mechanism includes a column guide, said column guide being mounted on said top plate and extending into said housing and including a central opening for supporting said vertical feed column.

---

**4,369,680**

## METHOD AND APPARATUS FOR CHANGING SLICER CUTTING PARAMETERS IN A ROTARY FOOD PROCESSOR

**James E. Williams, Stamford, Conn., assignor to Cuisinarts Research & Development Inc., Greenwich, Conn.**

**Filed Nov. 26, 1980, Ser. No. 210,272**
**Int. Cl.³ B26D *7/00***
**U.S. Cl. 83—13** **21 Claims**

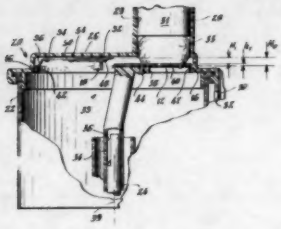
12. A method for changing the thickness of cut pieces produced by a rotary food processing tool in a food processor of the type including a housing having an electric motor drive, a bowl mountable on said housing for enclosing a rotary food processing tool within said bowl, said tool being rotatable within said bowl by said electric motor drive, a removable cover adapted to be secured in position on said bowl, a feed tube forming a passageway for feeding food items into said bowl, said food processing tool having an elongated hub with a head on one end thereof and a coupling means on the other end thereof adapted to be coupled to and rotated by said electric motor drive, and a horizontal disc-like member secured to said hub head and having an opening therethrough with slicing

means positioned at an elevated location relative to said disc-like member, said slicing means being located near said opening for allowing the cut pieces of food items to pass down through said opening, the thickness of the cut pieces produced being determined by the difference in elevation between said slicing means and the top of said disc-like member,

said method comprising the steps of:

selecting a cover disc of predetermined thickness,

fitting said cover disc of predetermined thickness in mounted relationship over said disc-like member with the



cover disc remaining in continuous contact with the upper surface of the disc-like member for changing the elevation between said slicing means and the top of said disc-like member, and

engaging said cover disc with said tool for causing said cover disc to rotate with said tool for defining a smaller difference in elevation between the slicing means and the top surface of said cover disc,

whereby the cut pieces are now equal to said smaller difference in elevation.

---

**4,369,681**

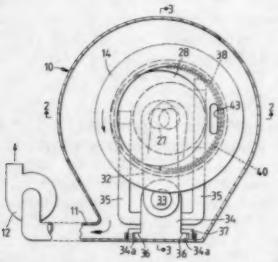
**INSIDE-OUT CUTTER FOR ELONGATED MATERIAL SUCH AS TOW**

**Donald W. Van Doorn, and James B. Hawkins, both of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.**

**Filed Nov. 19, 1980, Ser. No. 208,160**

**Int. Cl.³ D10G *1/04, 1/00***

**U.S. Cl. 83—100** **17 Claims**



2. In apparatus for cutting elongated fiber-like material into short lengths,

(a) a driven rotary reel carrying a plurality of spaced apart circularly arranged knives having inwardly directed cutting edges,

(b) means to feed the material to be cut into overlapping layers with the outermost layer in contact with the cutting edges of the knives,

(c) a single pressure roller disposed to contact a segment of the innermost of the layers and force the outermost ones thereof into cutting engagement with the knives adjacent said segment,

and

(d) means mounting the pressure roller for radial movement from a working position located offset from the axial center of the reel to a non-working position nearer the axial center of the reel.

---

**4,369,682**

**ROTARY DIE CUTTERS HAVING MAGNETICALLY-ATTRACTED WASTE EJECTOR**

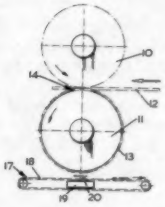
**Thomas K. Bunnell, Prestbury, England, assignor to Dolan Corrugated Containers Limited, Stalybridge, England**

**Filed Jan. 30, 1981, Ser. No. 230,184**

**Claims priority, application United Kingdom, Feb. 23, 1980, 8006211**

**Int. Cl.³ B21D *45/04***

**U.S. Cl. 83—112** **2 Claims**



1. A rotary die cutter, comprising: an upper rotary anvil, a lower rotary anvil defining with the upper rotary anvil a nip through which board to be cut can be passed, at least one cutting rule mounted on the circumference of the lower rotary anvil and defining an area adapted to be cut in a board by the rule, a metallic pusher supported within the area defined by the cutting rule for movement radially of the lower rotary anvil whereat it protrudes outwardly of the cutting rule to eject any cut waste board contained within the cutting rule, a waste-removal conveyor disposed below the lower rotary anvil, and magnetic means disposed below an upper run of the conveyor to attract the pusher as its associated cutting rule passes the conveyor and cause the pusher to move radially outwards and eject the cut waste board.

---

**4,369,683**

**DISCHARGING DEVICE FOR AN EXTRUSION PRESS**

**Hartmut Bieg, Augsburg; Hans Jonas, Gersthofen, both of Fed. Rep. of Germany; Heinz Rosswurm, Hickman, Ky.; Wilhelm Demmer, Frankfurt am Main, and Ludwig Döbel, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany**

**Filed Mar. 26, 1981, Ser. No. 247,815**

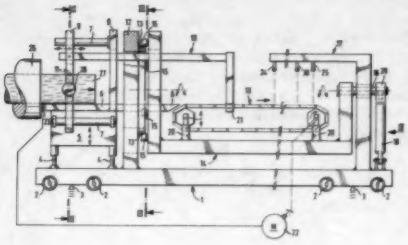
**Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046270**

**Int. Cl.³ B30B *11/06*; B28B *11/16***

**U.S. Cl. 83—157** **3 Claims**

1. Discharging device for an extrusion press, comprising a frame being movable in the axial direction of the press; a first part being connected to said frame and adjustable in height, said first part including a substantially flat plate and cutting means; a second part being movable relative to said frame and being adjustable in height, said second part including a horizontally disposed axle, a conveyor belt being suspended from said axle and tiltable about the axis of the press, and a coupling

for said conveyor belt; a coupling rod for said cutting means being engageable with said coupling for periodically connecting said cutting means to said conveyor belt; and a continuously variable drive driving said conveyor belt.



---

**4,369,684**

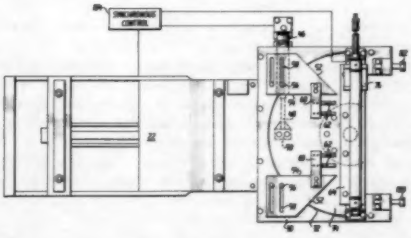
**APPARATUS FOR CUTTING STRIP MATERIAL**

**Gifford T. Perman, and David A. Poff, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.**

**Filed Nov. 18, 1980, Ser. No. 208,103**

**Int. Cl.³ B26D *1/18, 1/20***

**U.S. Cl. 83—216** **3 Claims**



**1.** Apparatus for cutting a strip of sheet material into segments, comprising:

a source of strip material, said strip having an axis;

means for feeding said strip material;

means operatively associated with said means for feeding, both for cutting said strip across its width starting on one side at a first angle to and at a first position along said axis, and for cutting said strip across its width starting on the other side at a second, different angle to and at a second position along said axis, said second position being spaced from said first position due to movement of said strip by said means for feeding; said means for cutting comprising a support table having a top surface onto which said strip is fed by said means for feeding; a cutting plate mounted on said table and oriented across the path traversed by said strip, said cutting plate having a first cutting edge; a guide track supported on said support table adjacent said cutting plate and across said path, said guide track comprising a gear rack on one side thereof; a carriage mounted for movement on said guide track, said carriage comprising a cutting wheel having at its periphery a second cutting edge, a shaft for mounting said cutting wheel for rotation with said second cutting edge adjacent said first cutting edge, a gear mounted on said shaft for rotation with said cutting wheel and gear means meshed with said gear and said gear rack for rotating said cutting wheel in opposite directions for cutting said strip at said first and second angles; means for moving said carriage along said guide track; and means for rotating said cutting plate, said guide track and said carriage between said first and second angles; and

control means for timing the operation of said means for feeding and said means for cutting to intermittently and automatically feed said strip and stop it to effect a cut at said first angle; adjust said means for cutting for operation at said second, different angle; feed said strip and stop it to effect a cut at said second, different angle; and adjust said means for cutting for operation at said first angle.

---

**4,369,685**

**BAND SAW BLADE**

**Donald L. Trigg, 10934 Gazette Ave., Chatsworth, Calif. 91311**

**Filed Oct. 10, 1980, Ser. No. 195,989**

**Int. Cl.³ B23D *61/12***

**U.S. Cl. 83—661** **7 Claims**

**1.** In a band saw blade having a belt-like configuration to allow the blade to circulate during operation, the improvement comprising:

(a) said blade comprising a first blade member and a second blade member laminated thereto, each of said blade members being planar, of substantially constant thickness, and having opposed ends;

(b) said blade members being of substantially equal lengths and aligned with their ends offset to form a joint; and

(c) means associated with said joint, said means comprising interlocking mating members including first mating means associated with said first blade member and a second mating means associated with said second blade member for securing said joint so that said blade may be threaded through an interior portion of a work piece and assembled into a belt-like configuration for operation.

---

**4,369,686**

**METAL-SAWING MACHINE**

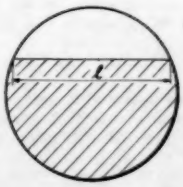
**Tadahiro Sugimoto, Amagasaki, Japan, assignor to Daito Seiki Company Limited, Osaka, Japan**

**Filed Jan. 23, 1981, Ser. No. 227,717**

**Claims priority, application Japan, Jan. 31, 1980, 55-11177**

**Int. Cl.³ B23D *55/08***

**U.S. Cl. 83—801** **5 Claims**



**1.** A metal-sawing machine for cutting a work in the rocking motion of a saw blade, which machine comprises:

a guide frame vertically movable with respect to a vice mounted on a bed, said vice being adapted to hold a work;

a saw carrier including a pair of saw wheels on which an endless saw blade is carried so as to run in a loop around said saw wheels;

a pair of servo-cylinders one on the left-hand section and the other on the right-hand section of said saw carrier;

each of said servo-cylinders being connected at its one end to said guide frame at a first pivotal point while the opposite end thereof is connected to said saw carrier at a second pivotal point;

rocking motion control means for alternately differentiating the distance between said first and second pivotal points of each of said servo-cylinders, thereby enabling said saw carrier to rock in the cutting plane with respect to said work held on said vice; and

guide means for preventing said saw carrier from horizontal displacement with respect to said work.

---

**4,369,687**

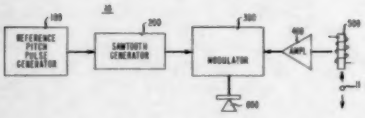
## PITCH SENSOR

**Stanley T. Meyers, 122 N. Riverside Ave., Red Bank, N.J. 07701**

**Filed Jun. 11, 1980, Ser. No. 158,474**

**Int. Cl.³ G01R *23/14*; G10G *7/02***

**U.S. Cl. 84—454** **17 Claims**




1. A pitch sensor for determining the frequency of a first signal from a first signal source comprising:

reference pitch pulse generating means for providing a plurality of equal-time interval reference pitch pulses;

saw-tooth generating means being responsive to said reference pitch pulse generating means for providing a plurality of equal-time interval ramp wave-forms;

probe sensing means being responsive to said first signal source for providing a first electrical signal representative of said first signal; and

modulator means being jointly responsive to said saw-tooth generating means and to said probe sensing means for sampling said saw-tooth ramp wave-form with said first electrical signal, the output of said modulator means indicating whether the frequency of said first signal is above or below said reference pitch pulses.

---

**4,369,688**

## METHOD AND APPARATUS FOR PRODUCING A DETONATING CORD

**Malak E. Yunan, Boonton Township, Morris County, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 842,096, Oct. 17, 1977, Pat. No. 4,232,606, which is a continuation-in-part of Ser. No. 762,824, Jan. 26, 1977, abandoned. This application May 19, 1980, Ser. No. 151,243**

**Int. Cl.³ C06B *21/00***

**U.S. Cl. 86—1 R** **11 Claims**

1. A method of producing a detonating cord comprising

(a) forming a mixture of cap-sensitive crystalline high explosive compound and a binding agent therefor into a continuous solid core;

(b) drawing strands of yarn under tension sufficient to form a moving cage of substantially parallel longitudinal strands;

(c) allowing said moving cage to entrain said core within it, whereby said cage becomes a conveyor for said core;

(d) applying a layer of soft plastic material around said moving cage while effecting substantially no change in the diameter of said core after its entrainment within said cage; and

(e) hardening the plastic material.

---

**4,369,689**

## METHOD FOR MIXING AND PLACING EXPLOSIVE COMPOSITIONS

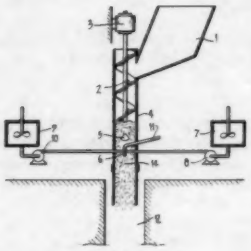
**Paul F. Donaghue, Bundoora; Thomas L. Love, Deer Park; Kenneth A. W. Mitchell, Cheltenham, and Maxwell G. Pitt, Prahran, all of Australia, assignors to ICI Australia Limited, Victoria, Australia**

**Filed Sep. 24, 1980, Ser. No. 190,251**

**Claims priority, application Australia, Oct. 5, 1979, PE0804**

**Int. Cl.³ C06D *1/08***

**U.S. Cl. 86—20 C** **8 Claims**



1. A process for the preparation of an explosive composition comprising a dispersion of an explosive component located in and immobilized by a solidified foamed non-explosive matrix which process comprises: forming a hollow stream of solid particles of said explosive component; mixing said stream of solid particles with a stream of liquid droplets comprising a precursor for said foamed non-explosive matrix by generating a stream of said liquid droplets within said hollow stream of solid particles; and introducing said stream of solid particles and liquid droplets into a container.

---

**4,369,690**

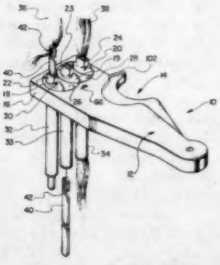
## HAIR BRAIDING APPARATUS

**Jurgis Sapkus, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.**

**Filed Sep. 18, 1981, Ser. No. 303,336**

**Int. Cl.³ A45D *2/00, 6/00, 1/00*; D04C *7/00***

**U.S. Cl. 87—33** **11 Claims**



1. In hair braiding apparatus, the combination comprising:

housing means configured for being hand held;

lever means pivotally supported within said housing, said lever means being configured for hand operation;

rack means operable in conjunction with said lever means;

first, second and third gear means in aligned relation, each of

said gear means being movably supported within said housing means and having aperture means for passage therethrough of a strand of hair to be braided; and

means operable by said rack means and coacting with said first, second and third gear means for interchanging the positions of a first two adjacent ones of said gear means in response to pivoting of said lever means in one direction, and for interchanging the positions of the third of said gear means with the adjacently positioned gear means in response to pivoting of said lever means in the opposite direction, whereby repeated pivoting of said lever means cause the braiding of the strands of hair.

6. In hair braiding apparatus, the combination comprising:

housing means configured for being hand held;

lever means pivotally supported within said housing, said lever means being configured for hand operation;

arcuately configured rack means on said lever means;

bias means coacting with said lever means for urging said lever means in a first direction;

first, second and third generally identically configured elliptical gear members positioned in aligned relation, each of said elliptical gear members being movably supported within said housing means and having aperture means for passage therethrough of strands of hair to be braided;

first and second generally identically configured sector gear members positioned between adjacent ones of said elliptical gear members, one of said sector gear members and the adjacent ones of said elliptical gear members being configured for providing a rotatable composite gear member;

a pinion gear member having the axle thereof mounted within a pair opposing elongate slots within said housing means, said pinion gear member being in constant meshing engagement with said rack means and movable into meshing engagement with a first composite gear member for interchanging the positions of a first two adjacent ones of said elliptical gear members in response to pivoting of said lever means in one direction, and movable into meshing engagement with a second composite gear member for interchanging the positions of the third of said elliptical gear members with the adjacently positioned elliptical gear member in response to pivoting of said lever means in the opposite direction, whereby repeated pivoting of said lever means causes braiding of the strands of hair.

---

**4,369,691**

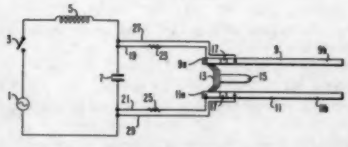
## PROJECTILE LAUNCHING SYSTEM WITH RESISTIVE INSERT IN THE BREECH

**Frederick J. Baehr, Jr., Murrysville Boro; George A. Kemeny, Wilkins Township, Allegheny County, both of Pa., and John P. Barber, Kettering, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 10, 1980, Ser. No. 185,706**

**Int. Cl.³ F41F *1/00***

**U.S. Cl. 89—8** **16 Claims**



1. An electromagnetic projectile launching system comprising:

a pair of conductive rails;

means for conducting current between said rails and for propelling a projectile from the leading ends of said rails to the other ends;

a high current source;

means for switching current from said current source to said rails;

and a resistance electrically connected between said switching means and said means for conducting current between said rails and for propelling a projectile so that the resistance is only in the circuit during the initial movement at the leading ends of the rails of the means for conducting current between the rails and for propelling the projectile.

---

**4,369,692**

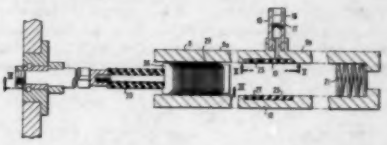
## SWITCHING SYSTEM FOR HIGH DC CURRENT

**George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 100,302, Dec. 4, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,925**

**Int. Cl.³ F41F *1/02***

**U.S. Cl. 89—8** **25 Claims**



22. A rail gun switching system for switching high DC current fed into a first pair of generally rail parallel conductors from an electrical power source to a second pair of conductors, said switching system comprising:

a separate conductor disposed generally parallel to said first pair of conductors,

an armature disposed between each conductor of said first pair of conductors and said separate conductor,

means for initially restraining said armatures adjacent one end of said first pair of conductors,

means for rapidly propelling said armatures from one end of said first pair of conductors to the other,

said second pair of conductors being spaced from said one end of said first pair of conductors,

an insulating strip disposed on each conductor of said first pair,

a pair of insulation strips disposed on said separate conductor adjacent said insulating strips on said first pair of conductors, whereby multiple series arcs are formed between said armatures, said first pair of conductors and said separate conductor.

---

**4,369,693**

## ELECTROHYDRAULIC SERVOMECHANISM

**Eckehart Schulze, Weissach-Flacht, Fed. Rep. of Germany, assignor to Hartmann & Lämmle GmbH & Co. KG, Rutesheim, Fed. Rep. of Germany**

**Filed Mar. 5, 1980, Ser. No. 127,402**

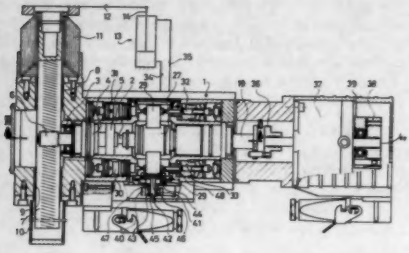
**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910530**

**Int. Cl.³ F15B *21/02***

**U.S. Cl. 91—35** **23 Claims**

1. A servomechanism, comprising a housing having one end and another end; a stepper motor casing on said one end and accomodating a stepper motor therein connected to a coupling; a rack on said other end; a sleeve-shaped tap extending rearwardly from the coupling into the housing and surrounding a major part of a threaded spindle extending coaxially to the tap and supporting a pinion on its one end remote from the stepper motor, the pinion meshing with the rack which is in an oblique position to the spindle; a fixed first ball bearing connected with the spindle and extending from the spindle end remote from the pinion along a part of the spindle and being arranged between the spindle and the tap, the ball bearing including a cage having an outside facing the tap and provided

with a first group of balls separated by said cage and in engagement with respective grooves arranged on the surface of the tap facing the ball bearing for permitting a relative movement



in axial direction between the tap and the spindle; and a switching mechanism associated with the tap and connected to a working unit via a plurality of control valves, the working unit being connected to one end of the rack for rotating the spindle.

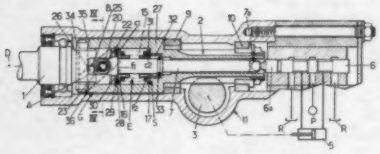
---

**4,369,694**

## POWER STEERING FOR MOTOR VEHICLES

**Jean Perineau, Fresnes, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France**

**Filed Jun. 16, 1980, Ser. No. 159,498**
**Claims priority, application France, Jun. 22, 1979, 79 16131**
**Int. Cl.³ F15B *9/10***
**U.S. Cl. 91—368** **3 Claims**



1. Power steering with rotary shaft adapted to drive a pinion cooperating with a rack, comprising:

a distributor of pressurized fluid for controlling a motor assisting the movement of the rack, which distributor comprises a slide valve coaxial with the pinion and situated on the side opposite the shaft;

a connection rod passing axially through the pinion and connecting, particularly by means of a jointed coupling, one end of the slide valve to a piece linked in rotation with said shaft, but free to slide with respect to said shaft, said piece being adapted to cooperate, when it rotates, with a bearing surface immovable in the direction of the axis of the pinion and sloping with respect to this axis, so that said piece, and so the rod and the slide valve, move axially in response to a rotational movement of the shaft, said piece being formed by a transverse pin adapted to cooperate with a drive fork integral with the shaft, this pin being extended radially beyond the shaft so as to cooperate with said bearing surface formed by edges, sloping with respect to the axis of the pinion, of an aperture provided in an extension of a tubular part of the pinion which is locked axially,

said power steering further comprising a resilient double-acting means for returning the slide valve to the neutral position, provided in the form of a spring disposed inside the tubular part extension and surrounding the rod, said spring being disposed axially between two stop zones provided in the tubular part extension and fixed in the direction of the axis of the pinion and situated radially outwardly of two bearing zones, and said two bearing zones connected axially to said rod.

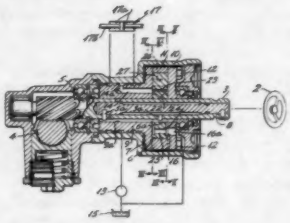
---

**4,369,695**

## POWER STEERING APPARATUS FOR VEHICLE

**Masao Nishikawa, Niiza; Yoshihiko Toshimitsu, and Takashi Aoki, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan**

**Division of Ser. No. 928,076, Jul. 26, 1978, Pat. No. 4,240,331.**
**This application Jul. 21, 1980, Ser. No. 171,015**
**Claims priority, application Japan, Jul. 29, 1977, 52/90261; Jul. 29, 1977, 52/90262**
**Int. Cl.³ F15B *9/08***
**U.S. Cl. 91—375 A** **1 Claim**



1. A rotary valve in combination with a power steering apparatus for a vehicle having a steering shaft, said rotary valve comprising a valve housing, a rotary type valve body in said housing arranged to be turned in either one direction or the other by turning operation of said steering shaft, an oil supply port in said housing connected to an oil pressure pump, and two cylinder ports in said housing connected to respective left and right chambers of a power cylinder, said valve body selectively connecting said oil supply port to either of said cylinder ports, said valve body having an opening therethrough for passing oil pressure from said oil supply port to the selected cylinder port and two non-annular pressure receiving surfaces formed in opposite faces of said valve body surrounding said opening, one of the pressure receiving surfaces is positioned immediately downstream of said oil pressure pump having a larger surface area than the other pressure receiving surface and said oil pressure acts solely on the pressure receiving surfaces which allows the valve to remain fixed axially along the steering shaft as the oil pressure acts on the larger receiving surface to prevent chattering.

---

**4,369,696**

## ELECTRO-PNEUMATIC CONTROL VALVE FOR PNEUMATIC DOOR ACTUATOR

**Alfred Klatt, Wathlingen, and Günther Singbartl, Hanover, both of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany**

**Filed Jan. 14, 1981, Ser. No. 225,077**
**Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006259**
**Int. Cl.³ F15B *13/04, 11/08***
**U.S. Cl. 91—465** **5 Claims**

1. A control valve device for a pneumatic actuator comprising:

(a) an inlet to which a source of compressed air is connected;

(b) first and second outlets connected respectively to the opposite sides of said pneumatic actuator;

(c) a first two-way valve member having a first position in which compressed air is connected from said inlet to said first outlet and having a second position in which compressed air is exhausted from said first outlet;

(d) a second two-way valve member having a first position in which compressed air is connected from said inlet to

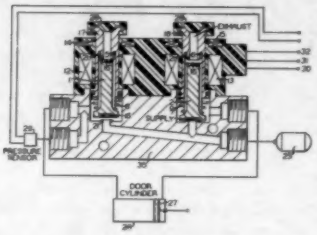
said second outlet, and having a second position in which compressed air is exhausted from said second outlet;

(e) each said first and second valve member comprising:

(i) a spring acting on said respective valve member to urge movement thereof toward a first position;

(ii) a primary coil having an electro-magnetic force when energized to urge said respective valve member toward a second position in opposition to said spring;

(iii) a permanent magnet arranged in such proximity of said respective valve member in said second position thereof as to magnetically atract and thereby maintain



said respective valve member in said second position following de-energization of said primary coil; and

(iv) a secondary coil arranged to magnetically counteract said permanent magnet when energized; and

(f) said primary and secondary coils of said first and second valve members being connected to one another so that a momentary impulse of electric current thereto causes said primary coil of one valve member and secondary coil of the second valve member to be simultaneously energized, whereby one of said valve members is operated to said first position and the other of said valve members is operated to said second position.

---

**4,369,697**

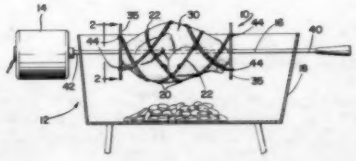
**SKEWER ATTACHMENT**

**Daniel R. Millington, 15921 Rhodolite Ct., Fountain Valley, Calif. 92708**

**Filed Apr. 13, 1981, Ser. No. 253,695**

**Int. Cl.³ A47J *00/00***

**U.S. Cl. 99—351** **5 Claims**



1. An improved attachment for securing a food product firmly in place on a rotatable skewer for barbecuing and the like, comprising:

a first end plate adapted to be received and positioned on said skewer so as to rotate therewith;

a second end plate adapted to be received and positioned on said skewer so as to rotate therewith, whereby said food product is interposed between each end plate;

said end plates being defined by a disc including a central hole having a configuration compatible with that of said skewer, to prevent lateral movement of said disc on said skewer;

means for firmly securing said end plates against said food product and firmly engaging said food product as said food product rotates relative to said rotating skewer;

wherein said securing means comprise a plurality of longitudinal stretchable members having free ends adapted to be removably connected to said end plates, and wherein said end plates include connecting means thereon;

wherein said connecting means comprise a plurality of radially extended slots formed in each of said plates.

---

**4,369,698**

**ARRANGEMENT FOR SEPARATING FRUITS INTO FRUIT PULP, FRUIT SKIN AND FRUIT CORE**

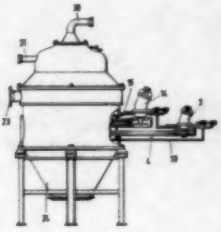
**Heinrich Hemfort, Oelde, Fed. Rep. of Germany; August Peitzmann, Woodside, Calif.; Wilhelm Neukötter, Oelde, Fed. Rep. of Germany; Gunthard Pautsch, Oelde, Fed. Rep. of Germany, and Hubert Günnewig, Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany**

**Filed Mar. 2, 1981, Ser. No. 238,989**

**Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008132**

**Int. Cl.³ A23N *1/00***

**U.S. Cl. 99—486** **17 Claims**



1. An arrangement for continuously separating a fruit pulp from a fruit skin and a fruit core of a fruit having a predetermined diameter, comprising a housing; a conical sieve element rotating in said housing; a hammer element rotating inside said sieve element so that the latter surrounds the former and including a plurality of conical hammer units detachably arranged and spaced from one another in an axial direction; means for rotating said hammer element with a predetermined speed of rotation and including a hollow shaft carrying said hammer units of said hammer element so as to form an axis of rotation of the latter and a driven shaft having a pin engaging in said hollow shaft; means for rotating said sieve element with a speed of rotation which is lower than the speed of rotation of said hammer element, so that the relation between the speed of rotation of said hammer element and the speed of rotation of said sieve element is within the region of between 2:1 and 4:1; means for adjusting said hammer units and arranged between said hollow shaft and said pin of said driven shaft; and a regulating disc located inside said sieve element above said hammer element and spaced from an inner surface of said sieve element by a distance which is greater than the diameter of the fruit.

---

**4,369,699**

**CAN FOLDING AND FLATTENING DEVICE**

**Harold E. Dailey, 6043 W. Crestwood Way #3, Glendale, Ariz. 85301**

**Filed Mar. 9, 1981, Ser. No. 241,481**

**Int. Cl.³ B30B *3/02***

**U.S. Cl. 100—156** **20 Claims**

1. A can folding device for folding cans, said cans having first and second ends nominally lying in planes perpendicular to the cylindrical axis of said cans comprising:

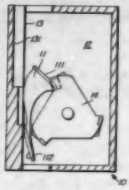
first and second rotary means having a common axis of rotation

said first rotary means comprising:

means for rotating a first end of a can to a first plane essen-

tially parallel to the cylindrical axis of the can; and, coupled thereto

said second rotary means comprising:



means for rotating a second end of the can to a second plane essentially parallel to the cylindrical axis of the can.

---

**4,369,700**

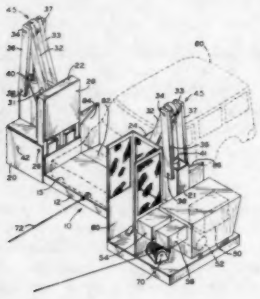
**APPARATUS FOR SALVAGE COMPACTING**

**Rodger H. Flagg, 1415 Lynn Ave., Ft. Wayne, Ind. 46805**

**Filed Sep. 8, 1980, Ser. No. 184,820**

**Int. Cl.³ B30B *9/32***

**U.S. Cl. 100—215** **36 Claims**



**1.** An apparatus for compacting salvage comprising:

a generally horizontally disposed frame having a horizontal bed and having secured thereto a frame end upstanding from the frame bed; a crushing pad pivotably attached to said frame end and pivotable from a generally vertical position to a generally horizontal position; first and second link arms pivotally connected near first of their respective ends; said first arm pivotally connected near its other end to said pad; said second arm being pivotally connected near its other end to said frame end;

a fluid cylinder assembly having one end pivotally connected to said first ends;

said assembly also being pivotally connected to said frame end whereby extension of said fluid assembly will push said link arms to pivot said pad toward said vertical position and retraction of said assembly will pull said link arms to pivot said pad downwardly toward said horizontal position in a power crushing stroke while at the same time reducing the bending moment on the fluid assembly as the pad is lowered and the resistance to crushing pad movement is increased and as the salvage is compacted between the crushing pad and the frame bed.

**4,369,701**

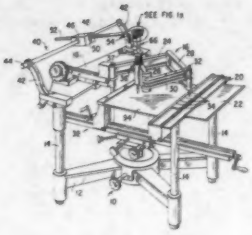
**CALLIGRAPHIC APPARATUS AND METHOD**

**William A. Richardson, 608 Snyder Ave., and Douglas A. Richardson, 27 Canterbury La., both of Berkeley Heights, N.J. 07922**

**Filed Mar. 4, 1981, Ser. No. 240,574**

**Int. Cl.³ B41F *1/07*; B43L *13/10***

**U.S. Cl. 101—32** **38 Claims**



**1.** A method of producing calligraphic lettering employing apparatus including holding means for holding a workpiece to be lettered, lettering means for lettering a workpiece held by said holding means, positioning means for fixedly positioning single-line indicia relative to a workpiece held by said holding means, following means for following single-line indicia fixedly positioned by said positioning means, connecting means for connecting said lettering means to said following means such that the movement of said lettering means copies the movement of said following means, said method comprising the step of attaching said lettering means to said connecting means such that said lettering means continuously and automatically rotates relative to said connecting means without rotating relative to a workpiece held by said holding means during the movement of said lettering means as it copies the movement of said following means, whereby single-line indicia fixedly positioned by said positioning means may be used to produce calligraphic lettering on a workpiece held by said holding means.

---

**4,369,702**

**MATERIAL ORIENTATION AND PRINTING APPARATUS**

**E. Michael Ackley, 1273 N. Church St., Moorestown, N.J. 08057**

**Continuation-in-part of Ser. No. 65,337, Aug. 9, 1979, Pat. No. 4,266,478, which is a continuation-in-part of Ser. No. 954,243, Oct. 24, 1978, Pat. No. 4,266,477. This application Feb. 5, 1981, Ser. No. 231,925**

**Claims priority, application Canada, Sep. 20, 1979, 236036**

**The portion of the term of this patent subsequent to May 12, 1999, has been disclaimed.**

**Int. Cl.³ B65G *47/24*; B41F *17/36***

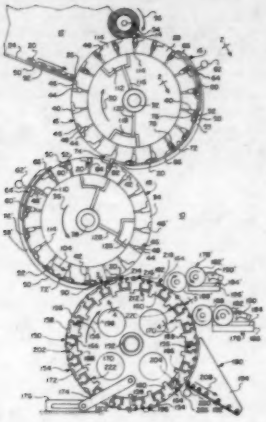
**U.S. Cl. 101—40** **6 Claims**

**1.** Apparatus for printing indicia on articles comprising:

means for supplying a plurality of articles which are to be marked with indicia;

conveying means for moving said articles along a predetermined path, said conveying means including (1) a plurality of carriers mounted for rotary movement about turning axes disposed perpendicular to said path and each having a pocket sized to receive one of said articles and permit rotation within said pocket of said article about its longitudinal axis, and (2) means for rotating said carriers about said turning axes from a position in which said pockets

extend in the direction of said path to a position in which said pockets extend transverse to said path;



and spin printing means positioned adjacent said path and downstream from the point at which said pockets extend transverse to said path for applying indicia to said articles.

---

**4,369,703**

## DEVICES FOR NUMERATION, OVERPRINTING, PERFORATION AND CUTTING ON OFFSET SHEET PRINTING MACHINES

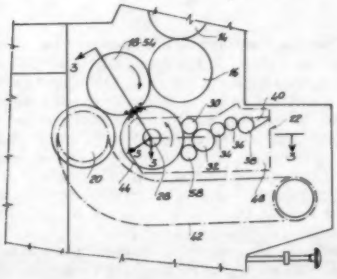
**Roberto Jarach, via Monte Rosa, 17, 20100 Milano, Italy**

**Filed Apr. 6, 1981, Ser. No. 251,301**

**Claims priority, application Italy, May 2, 1980, 21757 A/80**

**Int. Cl.³ B41F** *13/14*

**U.S. Cl. 101—76** **12 Claims**



**1.** In a sheet-fed offset machine, having a stationary machine frame having shoulders (**24**, **26**), a sheet feeder (**10**), which delivers sheets to a printing cylinder (**18**), said printing cylinder cooperating with a rubber cylinder and a plate cylinder (**14**), an inking mechanism, for the numeration device, perforation device and cutting device, a sheet delivery outlet (**20**), gear wheels for actuating the printing cylinder, the numeration device, and the inking mechanism, the improvement which comprises a subassembly slidable as a drawer (**22**) between said shoulders of the machine and arranged on the side of the sheet delivery outlet, said subassembly including the numeration device which comprises shaft (**28**), the inking roller (**30**), milling roller (**32**), intermediate roller (**34**), transfer roller (**36**) ink fountain (**40**), said numeration device being engageable with the printing cylinder (**18**), the perforation device, and the cutting device, a first gear wheel (**44**) for actuating the components of the drawer subassembly, which first gear wheel is supported by said shaft (**28**) and is actuated by a second gear wheel (**54**) coupled to the third gear wheel (**52**) of said printing cylinder.

---

**4,369,704**

## PRINTING DEVICE FOR DISTANCE COUNTER MECHANISM

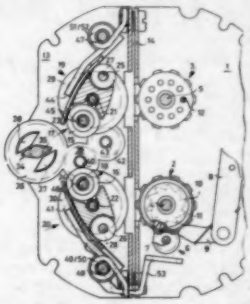
**Heinz Kelch, Königsfeld, and Eduard Schuh, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany**

**Filed Dec. 3, 1980, Ser. No. 212,577**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950118**

**Int. Cl.³ B30B** *9/06, 9/00*

**U.S. Cl. 101—110** **4 Claims**



**1.** A printing mechanism for recorders comprising at least two sets of type wheels juxtaposed relative to each other for rotation about parallel axes, means for enabling transfer of information contained in said type wheels into printed form onto a voucher, platen means coordinated for operation with said type wheel sets, and rotatably mounted platen carrier means having said platen means eccentrically mounted thereon, said type wheel sets and said platen carrier means being rotatable about axes which are disposed in planes parallel in pairs, said platen carrier means being interconnected by gear means such that said platen means rotate in directions opposite to each other, said platen means comprising at least one platen carrier, said mechanism further comprising a spring loaded lever designed to cooperate with said platen carrier, with a guide roll being disposed on at least said platen carrier interacting with said spring loaded lever so that a shaft of said guide roll will lie in a plane determined by shafts of said platen means and of said platen carrier means and wherein the sum of the radius of said platen carrier plus the center distance between said platen carrier and a platen mounted thereon is greater than the sum of the radius of said guide roll plus the center distance between said platen carrier and the guide roll.

---

**4,369,705**

## PRINTING PRESS

**Wilfred R. Gelinas, Jewett City, Conn., assignor to Harris Corporation, Melbourne, Fla.**

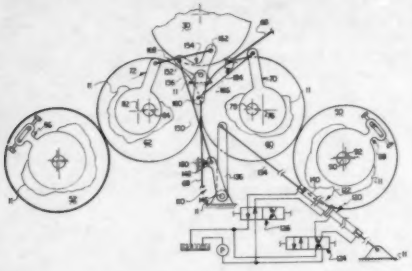
**Filed Sep. 24, 1980, Ser. No. 190,344**

**Int. Cl.³ B41F** *7/10, 7/12*

**U.S. Cl. 101—177** **11 Claims**

**1.** An offset printing press comprising a frame, a pair of rotatable plate cylinders supported in said frame, a pair of rotatable blanket cylinders supported in said frame, an impression cylinder rotatable about an axis fixed in said frame, said blanket cylinders having perfecting positions in which said blanket cylinders print on opposite sides of a web advanced therebetween and multi-impression positions in which said blanket cylinders print on a web advanced between each of

said blanket cylinders and said impression cylinder, means for shifting said blanket cylinders between said perfecting and multi-impression positions, said plate cylinders having first positions in which said plate cylinders engage said blanket cylinders when said blanket cylinders are in said perfecting positions and second positions in which said plate cylinders engage said blanket cylinders when said blanket cylinders are in said multi-impression positions, and means for shifting said plate cylinders between said first and second positions, said means for shifting said blanket cylinders including eccentric means mounted in said frame and supporting said blanket cylinders for movement along arcuate paths, linkage means connected with said eccentric means for actuating said eccentric means, and remotely actuatable motor means having a first portion connected to said frame and a second portion connected with said linkage means for moving said linkage means to four predetermined and distinct positions, one of said positions of said linkage means corresponding to said perfecting positions of said pair of blanket cylinders, one of said positions of said linkage means corresponding to said multi-impression positions of said pair of blanket cylinders, and the remaining two positions of said linkage means corresponding to throw off positions for said pair of blanket cylinders, said motor means comprising first and second cylinder assemblies each including a cylinder and a piston slidable within a respective one of said cylinder assemblies, said cylinder assemblies being connected with each other in tandem.



---

**4,369,706**

## CONTROL DEVICE FOR REMOTE ADJUSTMENTS OF INK ZONES IN PRINTING PRESSES

**Karl-Heinz Förster, Dresden; Hans Johne, Radebeul; Helmut Schuck, Coswig, and Ludwig Friedrich, Dresden, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.**

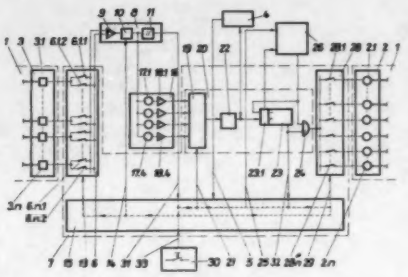
**Filed Apr. 8, 1981, Ser. No. 252,126**

**Claims priority, application German Democratic Rep., Apr. 10, 1980, 220346**

**Int. Cl.³ B41F *31/04***

**U.S. Cl. 101—365** **20 Claims**

1. In a control device for remote adjustments of ink zones in printing presses of the type having a control system, an adjustment device cooperating with an ink knife and a position measuring indicator cooperating with ink knife support elements for balancing the unsteady course of the positions of the ink knife support elements to the steady function of the knife bending curve, the improvement wherein the control system includes a plurality of multiplexers at the input and output sides thereof connected, respectively, with said adjustment device, a single motor control unit, and a program request control arranged with the multiplexers at the input side of the motor control system, said single motor control unit and the multiplexers at the output side of the control system one after another in sequence, the device further including a differential former and a computer, said differential former being interconnected between the multiplexers at the input side of said control system and said program request control, and said computer being interconnected between said differential former and said single motor control unit.



---

**4,369,707**

## SHORT CIRCUIT FUSE FOR ELECTRICAL IGNITERS

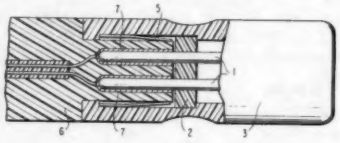
**Volker Budde, Grosskarlbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Jul. 10, 1979, Ser. No. 56,233**

**Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830552**

**Int. Cl.³ F42B *3/10***

**U.S. Cl. 102—202.2** **8 Claims**



1. A short-circuit fuse for a plug-in type electrical igniter, the fuse being adapted to automatically eliminate a short-circuit upon a connection of the igniter to a current carrying lead means, characterized in that a common socket means is provided for surrounding at least one electrode extending out of the igniter, at least one elongated leaf contact spring means extending essentially in parallel to the at least one electrode is disposed in the socket means so as to normally engage the at least one electrode and short-circuit the same when the igniter is unconnected to the current carrying lead means, the at least one contact spring means is arranged in the socket so as to be lifted off the at least one electrode means upon an insertion of a circuit connector plug of the current carrying lead means into the socket means.

---

**4,369,708**

## DELAY BLASTING CAP

**Paul J. Bryan, Hewitt, and Daniel R. Morse, Bloomingdale, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 21, 1979, Ser. No. 77,718**

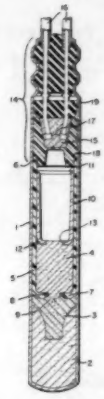
**Int. Cl.³ F42B *3/16***

**U.S. Cl. 102—202.13** **11 Claims**

1. In a delay blasting cap comprising a tubular metal shell integrally closed at one end and containing, in sequence from the closed end, (a) a base charge of a detonating explosive composition, (b) a priming charge of a heat-sensitive detonating explosive composition, (c) a delay charge of an exothermic-burning composition, and (d) an ignition assembly for igniting said delay charge, the improvement comprising a carrier ele-

ment for said delay charge, said carrier element consisting of a capsule or tube whose side wall provides a layer of polyethylene, polypropylene, or polytetrafluoroethylene between said delay charge and the inner wall of said tubular metal shell, said layer having a thickness in the range of about from 0.5 mm to 1.7 mm, said delay charge having been pressed into said carrier element with a force of at least about 890 Newtons, and said priming charge being inhibited from penetrating into said delay charge by at least one of the following means: (1) pressing said priming charge into said shell with a force of at least about 225 Newtons, and (2) a barrier layer between said delay charge and said priming charge.

9. In a delay blasting cap comprising a tubular metal shell integrally closed at one end and containing, in sequence from the closed end, (a) a base charge of a detonating explosive



composition, (b) a priming charge of a heat-sensitive detonating explosive composition, (c) a delay charge of an exothermic-burning composition, and (d) an ignition assembly for igniting said delay charge, the improvement comprising (1) a tubular polyolefin or polyfluorocarbon capsule holding said delay charge and nested within said tubular metal shell, said tubular polyolefin or polyfluorocarbon capsule having one open extremity and a closure at the other extremity provided with an axial orifice therethrough, said closure on said polyolefin or polyfluorocarbon capsule being adjacent to said priming charge; and (2) a tubular rigid metal capsule nested within said polyolefin or polyfluorocarbon delay-charge-carrying capsule, said rigid metal capsule having one open extremity and a closure at the other extremity provided with an axial orifice therethrough, said closure on said rigid metal capsule being adjacent to said delay charge.

---

**4,369,709**

## UNDERWATER DETONATING DEVICE

**Guenter Backstein, Meerbusch; Hans W. Unger, Krefeld; Michael Guenther, Duesseldorf; Dieter Kaltbeitzer, Duesseldorf, all of Fed. Rep. of Germany, and Hendrik Veldhoen, Overijse, Belgium, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany**

**Filed Sep. 24, 1980, Ser. No. 190,420**

**Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939700; Sep. 29, 1979, 2939711**

**Int. Cl.³ F42C *15/32***

**U.S. Cl. 102—229** **35 Claims**

1. Underwater ignition device comprising

a rotor;

a detonator disposed at the rotor;

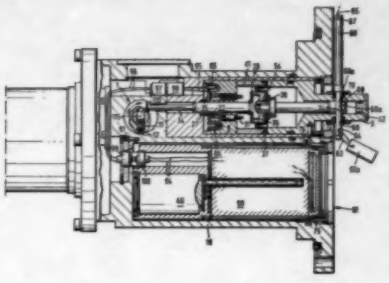
a safety pin;

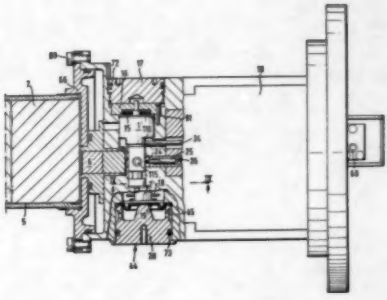
a locking pin secured in position by the safety pin;

a release pin maintained in position by the locking pin;

a first water pressure safety device normally engaging the rotor and preventing a rotating motion of the rotor into an ignition position; and

a second water pressure safety device actuable after the





locking pin is removed and after the first water pressure safety device has been actuated and capable of actuating the release pin for rotating the rotor into an ignition position.

---

**4,369,710**

## END-BURNING GAS-GENERATING COMPOSITION GRAIN CONTAINING INTERTWISTED WIRES

**Hisao Okamoto, Sayama, and Daizo Fukuma, Sakado, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Mar. 16, 1981, Ser. No. 243,894**

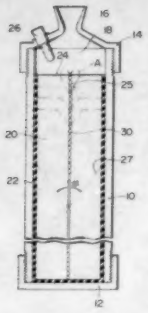
**Claims priority, application Japan, Mar. 18, 1980, 55-35649**

**Int. Cl.³ F42B *1/00***

**U.S. Cl. 102—289** **8 Claims**

1. In an end-burning grain of a solid gas-generating composition containing embedded therein an elongate metal heat-conducting element to increase mass burning rate of the grain by the effect of heat transferred during combustion of the grain

from the hot combustion gas to the unburned portion of the grain through the heat-conducting element,



the improvement comprising said heat-conducting element being constituted of at least two wires which are loosely twisted together.

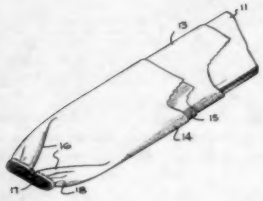
---

**4,369,711**

## BAG FOR EXPLOSIVES WITH LOWER REINFORCING SLEEVES

**Harold Leader, Box 400, Industrial Park, Helena, Ala. 35080**

**Filed Nov. 24, 1980, Ser. No. 209,985**
**Int. Cl.³ F42B *3/00***
**U.S. Cl. 102—324** **2 Claims**



1. A bag for explosives, said bag comprising: an inner tubular plastic liner adapted to receive a quantity of granular explosive material therein, an outer woven plastic body member having said tubular liner therein, sleeves mounted on the lower portion of the bag and surrounding approximately the lowermost one-third portion of said body member, the lower end portion of the bag being folded inwardly and over upon itself, the lower end of the bag being secured closed to form a closed bottom end, and a tie member for closing the upper end of the bag, said bag being free of longitudinal seams.

---

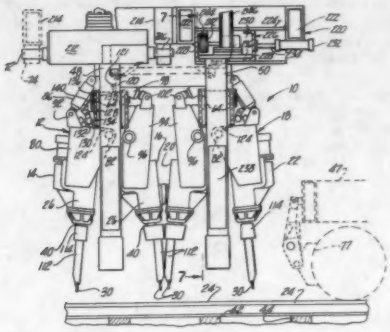
**4,369,712**

## RAILROAD TAMPING MACHINE

**Helmuth von Beckmann, Columbia, S.C., assignor to Canron Corporation, West Columbia, S.C.**

**Continuation-in-part of Ser. No. 84,307, Oct. 12, 1979, Pat. No. 4,282,815. This application Feb. 11, 1981, Ser. No. 233,555**
**Int. Cl.³ E01B *27/014***
**U.S. Cl. 104—12** **6 Claims**

1. A railroad tamping machine mounted on a railroad vehicle for movement along a railroad track comprising: a pair of longitudinally spaced workheads each including a pair of tamping units arranged longitudinally of a rail of a railroad track with said pair of tamping units of each workhead being disposed at opposite sides of one tie of a pair of adjacent ties, one tamping unit of each of said workheads being disposed between adjacent ties, said pair of tamping units of each workhead being supported for swinging movement toward and away from each other about horizontal transverse axes and at opposite sides of an associated tie, said workheads being supported relative to said vehicle for vertical movement simultaneously and independently of each other, one of said workheads being supported for independent horizontal lateral movement to selected positions relative to the other of said workheads, said vehicle and said rail, and means to hold said other of said pair of workheads in an elevated inoperative position.



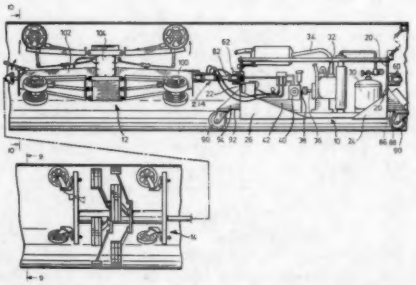
---

**4,369,713**

## PIPELINE CRAWLER

**Anthony C. Richardson, Agincourt, Canada, assignor to Transcanada Pipelines Ltd., Scarborough, Canada**

**Filed Oct. 20, 1980, Ser. No. 198,492**
**Int. Cl.³ B61B *13/10***
**U.S. Cl. 104—138 G** **27 Claims**



2. A pipeline crawler comprising a tractor unit having a plurality of driven wheels for engagement with the interior wall of a pipeline, a self-righting power unit and means connecting said tractor unit to said power unit, said connecting means comprising power transmission means for transmitting power from said power unit to said tractor unit, said power transmission means comprising a first rotary connection, and mechanical connection means for transmitting traction forces from said tractor unit to said power unit, said mechanical connection means comprising a second rotary connection and said first and second rotary connections being coaxial to permit rotation of said tractor unit relative to said power unit.

4,369,714

## CABLE CAR DOCKING SWAY ARRESTER MECHANISM

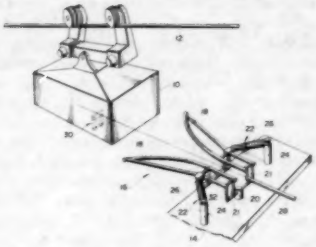
Masaaki Morita, Yokosuka; Michio Yamaguchi, Yokohama, and Hiroyuki Asano, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 21, 1980, Ser. No. 209,027

Claims priority, application Japan, Nov. 27, 1979, 54-164477[U]; Apr. 7, 1980, 55-45790[U]; Apr. 8, 1980, 55-46416[U]; Sep. 24, 1980, 55-135708[U]; Sep. 26, 1980, 55-137452[U]

Int. Cl.³ B61B 3/02, 7/06, 12/04

U.S. Cl. 104—250 10 Claims



1. A vehicular system comprising:

a cable car suspended on a cable extending from a cable car station;

an arrester mechanism for damping the swinging motion of said cable car as it approaches and enters said station, said arrester mechanism being disposed at one end of said station and arranged to extend beyond said end of said station and which includes:

first and second arrester trumpet bars pivotally mounted at one end to said station, said trumpet bars flaring outwardly to define an opening therebetween;

a damper device interconnecting one of said trumpet bars and said station, said damper device including means for absorbing kinetic energy;

contact means on said cable car for entering the space defined between said trumpet bars and for alternatively contacting the inboard surfaces of said trumpet bars as said cable car approaches said station; and

linkage means interconnecting said trumpet bars for causing said trumpet bars to move together so that upon impact of said contact means on said first trumpet bar and displacement thereof from a home position, said second trumpet bar will be displaced to increase the distance through which it may be subsequently displaced and the amount of kinetic energy of the cable car which is absorbed by said subsequent displacement, said damper device returning said first trumpet bar to said home position.

---

4,369,715

## RESILIENT HINGE ASSEMBLY FOR A DISPLAY STRUCTURE

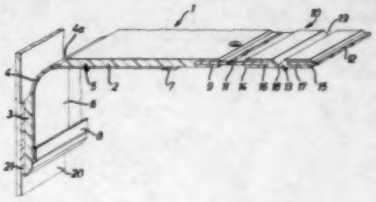
Brian Ingersoll, Marietta, and Ferris L. Hutchins, Jr., Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 31, 1980, Ser. No. 174,080

Int. Cl.³ A47F 5/12

U.S. Cl. 108—2 6 Claims

1. A resilient hinge assembly comprising a generally flat band of plastics material formed to provide a pair of spaced end elements, a flexible connecting piece integrally joined to said end elements for providing a bendable bridge therebetween, said bendable bridge being formed by a portion of said band having a reduced thickness in relation to said end elements, and an external leaf spring detachably connected to said end elements and extending along an undersurface of said bendable bridge, wherein said leaf spring imparts a restoring force to the bendable bridge so as to urge the assembly from a strained condition in which said bridge is flexed into a generally arcuate configuration, into an unstrained condition in which said end elements and said bendable bridge are generally co-planar, said hinge assembly further comprising guide means



provided by said end elements for releasably receiving said leaf spring in which said guide means comprises integral rib elements depending from said undersurface adjacent the unconnected edges of said end elements, said rib elements each including a portion spaced from the undersurface to provide a slot for receiving an edge portion of said leaf spring.

---

4,369,716

## DISPLAY PALLET

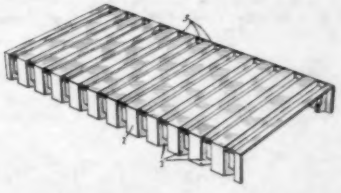
Edmund Munk, Oberstenfeld, and Helmuth Huber, Oberstenfeld-Gronau, both of Fed. Rep. of Germany, assignors to Furnier-U. Sperrholzwerk, J. F. Werz Jr. KG, Oberstenfeld, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 146,176

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918574

Int. Cl.³ B65D 19/24

U.S. Cl. 108—51.1 11 Claims



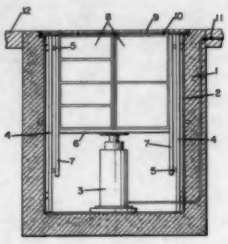
1. A display pallet which is adapted to be placed on a transport pallet and transported with the latter, comprising a substantially rectangular body having a rectangular load-bearing wall with two longitudinal and two transverse sides; two lateral supporting walls each extending along a respective one of said longitudinal sides of said load-bearing wall and having a lower edge forming a supporting face, and a plurality of depressions forming a plurality of ribs spaced from each other in direction of elongation of said body and separate from one another over their entire length, each of said ribs extending over said load-bearing wall, both said supporting walls to the lower ends of the latter, and forming at said lower ends inwardly directed extensions.

4,369,717

## DISAPPEARING UNDERGROUND SAFE

J. F. Bollier, Adliswil, Switzerland, assignor to Patmark Consultants, Newark, N.J.

Filed May 27, 1980, Ser. No. 153,692
Int. Cl.³ E05G 1/00
U.S. Cl. 109—45 14 Claims



1. A disappearing safe comprising
an outer shell from reinforced, high hardness and waterproof concrete;
an inner shell of a corrosion resistant steel casing attached to the outer shell;
a stop at the upper edge of the inner shell;
an elevating mechanism inside of the inner shell;
a steel platform connected to the elevating mechanism and which steel platform can be lifted up or lowered down by the elevating mechanism where the steel platform is attached to a steel frame with rollers guiding the motion of the steel frame;
a safe positioned on the steel platform; and
an armored plate on top of the safe, where in the lowered position of the safe the upper side of the armored plate is flush with the surrounding area and adapted to the contour of the upper edge of the shell and secured in position by the stop whereby if the safe is in the upper position the steel platform is about at the ground level and supported from below by the frame.

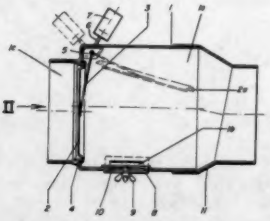
---

4,369,718

## SHUT-OFF SYSTEM FOR FLUE GAS CONDUITS OR AIR INTAKE CONDUITS IN OIL AND GAS FIRE SYSTEMS

Otto Eppinger, and Mariao Eppinger, both of Akazienweg 2, D-8898 Schrobenhausen 1, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 185,098
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1979, 2936296
Int. Cl.³ F23L 1/00
U.S. Cl. 110—163 7 Claims



1. A closure system for regulating the flow of exhaust gases or feed air of a fuel combustion system and preventing energy losses when combustion is not taking place, comprising a conduit for such gases or air; a rotatable shaft; a closure for controlling gaseous flow in said conduit between two conduit portions and biased normally into the closed position; said closure being supported by and movable with said rotatable shaft between alternate fully closed and fully open positions in said conduit; said conduit portions being of differing cross-sectional area; said closure being positioned between said two portions and arranged to permit gaseous flow from the smaller portion to the larger portion when in the open position; means interconnecting said closure with said rotatable shaft; said closure being responsive to slight pressure differences between said conduit portions tending to open said closure whereby said closure is readily movable about said shaft into the fully open position; counterweight means mounted on an arm connected to said rotatable shaft for urging said shaft in a direction of rotation resulting in biasing said closure into the closed position when said closure is in the closed position and for urging said shaft in a direction of rotation resulting in biasing said closure into the open position when said closure is in the open position; said closure requiring decreasing opening pressure for moving into the fully open position with increasing movement thereof away from the closed position, and being of such weight as to return to its normal closed position in opposition to said counterweight means upon substantial equalization of the pressure in said two conduit portions; and sealing means disposed between said two conduit portions; said closure effecting a substantially gas-tight seal and compressing said sealing means when in the fully closed position.

---

4,369,719

## VERMICULITE AS A DEPOSIT MODIFIER IN COAL FIRED BOILERS

Gary G. Engstrom, Kenosha, Wis., and Douglas I. Bain, Cincinnati, Ohio, assignors to Dearborn Chemical Company, Lake Zurich, Ill.

Filed Nov. 14, 1980, Ser. No. 207,006
Int. Cl.³ F23J 11/00
U.S. Cl. 110—345 8 Claims

1. Method of rendering fly ash deposits in a coal-fired furnace more friable, thereby facilitating their removal by steam or air probe, comprising injecting uncalcined vermiculite into the furnace at 3000°–1200° F.

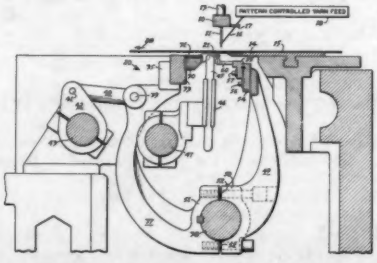
---

4,369,720

## TUFTING LOOPER APPARATUS WITH OPPOSED CLIP SUPPORT

Max M. Beasley, Chattanooga, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Aug. 10, 1981, Ser. No. 291,256
Int. Cl.³ D05C 15/36
U.S. Cl. 112—79 A 6 Claims



1. In a tufting machine having means for supporting the base fabric for longitudinal movement in the feeding direction through said machine, a plurality of transversely spaced reciprocal needles for introducing yarns through the base fabric to form loops, means for selectively controlling the length of a yarn fed to each of said needles, looper apparatus comprising:

(a) a hook for each needle cooperating with said corresponding needle to form a loop thereon,
(b) each of said hooks having a shank and a bill projecting longitudinally from said shank and terminating in a free end portion,
(c) reciprocal hook bar means supporting said hooks transversely spaced apart with said free end portions extending in the direction opposite said feed direction,
(d) a knife for each hook,
(e) knife supporting means supporting said knives transversely so that each knife cooperates with the bill of the corresponding hook for cutting a loop on said bill,
(f) a looper clip for each hook having a mounting portion and a clamp portion,
(g) clip support means securing said mounting portions so that said clips oppose said corresponding hooks and each of said clamp portions projects from said mounting portion in said feeding direction and is biased to normally engage said free end portion of said corresponding bill to normally hold the loops formed on said bill, but yieldable to predetermined yarn tension in a loop on said bill to force said clamp portion away from said bill to permit said tensioned loop to be withdrawn from the free end of said hook to form an uncut loop, and
(h) means connecting said clip support means to said reciprocal hook bar means for unitary movement of said clips and said hooks.

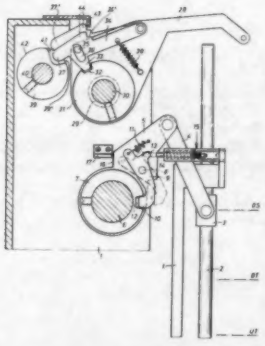
---

**4,369,721**

## EMBROIDERING MACHINE WITH THREAD CHANGER

**Kurt Bolldorf, Kaiserslautern, and Ernst Brückner, Neuwied, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany**

**Filed Sep. 10, 1980, Ser. No. 185,895**
**Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938903**
**Int. Cl.³ D05C *3/02***
**U.S. Cl. 112—98** **6 Claims**



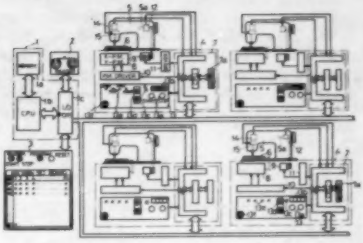
1. A thread changer for an embroidering machine, having a plurality of needles for different threads, comprising, drive means, a plurality of thread levers loosely mounted on said drive means, a coupling part for each thread lever connected to said drive means and movable with said drive means, and clutch means connected between said drive means and thread levers for coupling a selected one of said thread levers to said drive means to move said selected one of said thread levers into association with a selected one of the needles.

**4,369,722**

## CONTROL SYSTEM FOR A PLURALITY OF EMBROIDERY SEWING MACHINES

**Koji Nishida, Anjyo, and Osamu Miyake, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan**

**Filed Feb. 3, 1981, Ser. No. 231,089**
**Claims priority, application Japan, Feb. 8, 1980, 55-15580[U]; Feb. 21, 1980, 55-21213; Mar. 3, 1980, 55-26438**
**Int. Cl.³ D05C *5/04*; D05B *21/00***
**U.S. Cl. 112—103** **11 Claims**



1. A control system for a plurality of embroidery sewing machines, comprising
a plurality of branch electronic controllers each corresponding to one of the plurality of embroidery sewing machines, each of the branch controllers including buffer memory means, the branch controllers reading embroidery sewing control data from the buffer memory means and supplying it to an embroidery frame driver of the associated embroidery sewing machine, the branch controllers also presenting a request for embroidery sewing control data which is to be stored in the buffer memory means;
a random access memory capable of storing a plurality of sets of embroidery sewing control data;
and a main electronic controller responsive to a request for embroidery sewing control data from each of the branch controllers for reading a given number of blocks of embroidery sewing control data in a preselected set which is preselected to correspond to the requesting branch controller and supplying it to the requesting branch controller.

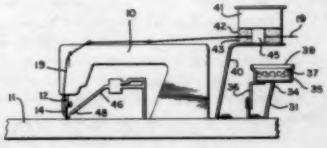
---

**4,369,723**

## NEEDLE LUBRICATOR SYSTEM

**William C. Griffith, Jr., and Charles E. Brocklehurst, both of Fountain Inn, S.C., assignors to Opelika Manufacturing Corporation, Chicago, Ill.**

**Continuation of Ser. No. 97,553, Nov. 26, 1979, abandoned, which is a continuation of Ser. No. 954,934, Oct. 26, 1978, abandoned. This application Feb. 25, 1981, Ser. No. 238,037**
**Int. Cl.³ D05B *71/04***
**U.S. Cl. 112—281** **4 Claims**



1. Apparatus for treating the tip of a sewing machine needle as the needle tip reciprocates from a position above the work piece, downwardly through the work piece to a position at a predetermined distance below the work piece, and then up-

wardly back through the work piece during its sewing function, said apparatus comprising an open ended tube for receiving a liquid lubricant therein, means for positioning said tube in the path of the needle tip with one of its openings supported in a stationary position facing upwardly and in alignment with the needle tip and at a distance below the work piece which is less than the distance the needle tip travels in a downward direction below the work piece so that the tip of the needle enters the upper opening of the tube as it reaches the bottom of its downward stroke, and means for supplying a liquid medium only lubricant to said tube through the other end of said tube to form a body of liquid medium only lubricant in said tube with a surface maintained at a level higher than the lowest movement of the needle tip, whereby the tip of the needle contacts the surface of the liquid medium lubricant in the tube as the needle reaches the bottom of its downward stroke.

---

**4,369,724**

## WINGSAIL

**John Weiss, 873 Arctic St., Lindenhurst, N.Y. 11757**

**Filed Aug. 5, 1980, Ser. No. 175,503**

**Int. Cl.³ B63B *15/02***

**U.S. Cl. 114—39** **11 Claims**

1. A flexible wing sail capable of cross-wind performance, reversible with respect to direction of air flow across the sail, and equipped with internal spars, comprising:

permanently windward and permanently leeward webs of flexible sheet material connected together at their edges and engaged there with tension strand means for extending said webs in wing sail form and for adjusting the airfoil profile to the reversible direction of air flow, said leeward web being of greater extent than said windward web in the general reversible direction of intended wind flow along the sail, so as to facilitate formation of an airfoil section having substantial thickness at its mid-portion; and

spar means for supporting said tension strand means, said spar means including a mast and a leewardly convex curved boom adjacently crossing each other in the space between said webs and running at least for most of their respective lengths between said webs, said tension strand means being supported at or near opposite ends of said mast and of said boom.

**4,369,725**

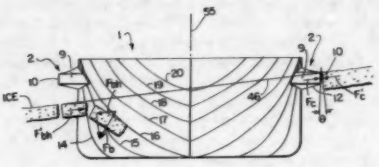
## METHOD AND MEANS FOR INCREASING THE MANEUVERABILITY OF A SHIP IN ICE-COVERED WATERS

**Steven M. Lord, Stoneham, Mass., and Hiroshi Tabuchi, Tokyo, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 920,797, Jun. 30, 1978, abandoned. This application Dec. 5, 1980, Ser. No. 213,641**

**Int. Cl.³ B63B *35/10***

**U.S. Cl. 114—40** **11 Claims**



1. A method for increasing the maneuverability of a ship in ice-covered water, such ship comprising a hull including port and starboard sides, each side having sloped portions for applying generally symmetrically distributed force to the ice covering on either side of said hull during straightforward travel and generally vertically oriented wall portions located above said sloped portions on each side of said ship, comprising the steps of:

positioning said ship such that said generally vertically oriented wall portion on one side of said ship is brought into contact with said ice covering while maintaining said sloped portion on an opposite side of said ship in contact with said ice covering; and

propelling said ship in a forward direction while maintaining said generally vertically oriented wall portion on said one side of said ship in contact with said ice while continuing to maintain said sloped portion on said opposite side of said ship in contact with said ice covering for a time sufficient to assist in a turning maneuver of said ship in the direction of said opposite side.

---

**4,369,726**

## SAILBOAT MAST

**Paul Mader, Klausenerplatz 20, 1000 Berlin 19, Fed. Rep. of Germany**

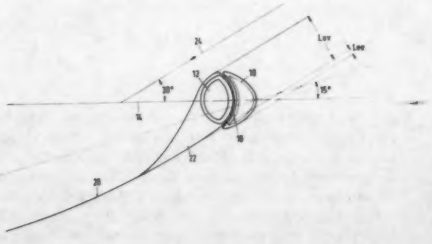
**PCT No. PCT/DE80/00020, § 371 Date Nov. 1, 1980, § 102(e) Date Oct. 27, 1980, PCT Pub. No. WO80/01787, PCT Pub. Date Sep. 4, 1980**

**PCT Filed Feb. 26, 1980, Ser. No. 212,719**

**Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907908**

**Int. Cl.³ B63B *15/00*; B63H *9/10***

**U.S. Cl. 114—90** **6 Claims**



1. A sailboat mast comprising of two mast parts extending

upwards from the boat hull with their longitudinal axes in the longitudinal vertical midplane of the hull, the aft one (12) of said mast parts being shaped and equipped for carrying a sail and being supported at its upper end on the forward mast part (10), said forward mast part (20) having a concave channel (32) along its aft side and being rigged to the hull (16) by means of shrouds and stays, said aft mast part (12) being free of standing rigging, both said mast parts having lower ends seated on the hull in suitable fittings, said sail (20) being fastenable to said aft mast part in a manner providing for said sail to set so that when working in a wind having a substantial athwartship component of direction, it always extends from the mast in a direction substantially tangential to the composite mast, and further comprising means (28), located at or near the mast top, for guiding and guidably supporting at least the upper portion of said aft mast part and connecting it to the upper portion of said forward mast part and also permitting said aft mast part to be bent away from said forward mast part for affecting the shape of the sail.

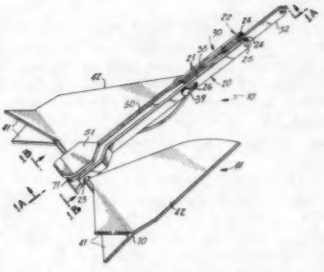
---

**4,369,727**

## ANCHOR

Rudolph Fasco, 2210 SW. 100th Ave., Miami, Fla. 33165

Filed Nov. 17, 1980, Ser. No. 207,252
Int. Cl.³ B63B *21/44*
U.S. Cl. 114—297 3 Claims



1. In an anchor of the type having a shank assembly comprising a pair of parallel longitudinal support bars spaced apart from each other, an axle perpendicular to said shank assembly and mounted on one end thereof, said axle having a U-shaped built-in protrusion in the middle and a plurality of flukes rigidly secured to said axle on opposite sides of said shank assembly, the improvement comprising:

(a) a chain lever pivotally mounted on the other end of said shank assembly, between said support bars, and having one end connected to the anchor line,

(b) a longitudinal bar member pivotally mounted on said axle on one end, positioned between said support bars, and provided with a pair of stoppers which contact said protrusion when said bar member is pivotally rotated, and

(c) a plurality of tripping palms rigidly mounted to said axle; and

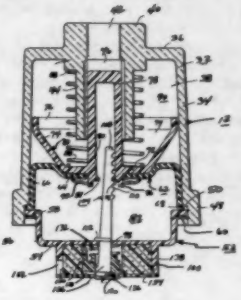
(d) tripping means pivotally connected to the other end of said chain lever and positioned in cooperative support for said longitudinal bar member when the angle of said chain lever with respect to the shank assembly is below a tripping angle.

**4,369,728**

## AIR FILTER RESTRICTION INDICATING DEVICE

Joseph N. Nelson, Waterloo, Iowa, assignor to Engineered Products Company, Waterloo, Iowa

Filed Feb. 9, 1981, Ser. No. 232,422
Int. Cl.³ G01L *19/12*
U.S. Cl. 116—276 5 Claims



1. In an improved air filter restriction indicating device for an air filter used with an internal combustion engine wherein the improved indicating device is in communication with the air flowing from the air filter to the air intake of the internal combustion engine and wherein the improved indicating device includes: a housing having a first end, a second end, and a side wall that includes a transparent portion, with the first and second ends and side wall defining a cylindrical, overall chamber in the housing and with the second end having an opening therein; a flexible diaphragm member disposed within the housing, with the diaphragm member having a central portion and an edge portion secured to the housing so that the diaphragm member divides the overall chamber into a first chamber, adjacent to the first end of the housing, and a second chamber, adjacent to the second end of the housing, and with the central portion of the diaphragm member being movable between an infold portion wherein it is more closely adjacent to the second end of the housing and an outfold position wherein it is more closely adjacent to the first end of the housing; an indicating member that is disposed within the first chamber in the housing and that is mounted on and carried by the diaphragm member, the indicating member being visible through the transparent portion of the side wall of the housing at least as the diaphragm member moves between its infold position and its outfold position; means for permitting communication between the air flowing from the air filter to the air intake of the internal combustion engine and the first chamber in the housing; means for permitting communication between the atmosphere and the second chamber in the housing; a coil compression spring disposed in the first chamber of the housing, with one end of the compression spring being in contact with the first end of the housing and the other end of the compression spring being in contact with the indicating member, with the compression spring having a compression force sufficient to balance the differential between atmospheric pressure in the second chamber of the housing and the vacuum being drawn in the first chamber by the air flowing from the air filter to the air intake of the internal combustion engine so that the indicating member will deform the diaphragm member into its infold position when the vacuum in the first chamber is relatively low and so that the diaphragm member, and the indicating member, will be moved from its infold position toward its outfold position in response to increases in the vacuum in the first chamber; and lock-up means for progressively locking the indicating member in the various positions which the indicating member attains within the first chamber as the diaphragm member moves from its infold position to its outfold position and for maintaining the indicating member in

its last such position even though the diaphragm member may thereafter return towards its infold position due to a subsequent decrease in the vacuum in the first chamber; the lock-up means including a centrally disposed cylindrical rod which is mounted on and carried by the central portion of the diaphragm member, which is in part disposed in the first chamber, and which projects from the diaphragm member toward the first end of the housing, with the cylindrical rod having a recess defined by a closed end, projecting towards the first end of the housing, an internal side wall, and an open end that is in communication with the second chamber; the lock-up means also including an elongated locking member having a first end and a second end, with the locking member being supported, for pivotal movement intermediate its ends, by a first portion of the second end of the housing, so that the second end of the locking member may be selectively, pivotably moved in the recess in the cylindrical rod through a predetermined arc, and with the second end of the locking member normally being disposed adjacent to the open end of the cylindrical rod and cooperating with the open end of the cylindrical rod so that the indicating member is progressively locked and maintained in position by engagement between the second end of the locking member and the cylindrical rod, the improvement comprising:

means for selectively pivoting the first end of the locking member through the predetermined arc and thus causing the second end of the locking means to pivot through the predetermined arc, in the recess in the cylindrical rod, the pivoting means including means carried by the first end of the locking member; a relatively flexible resetting cover which has an external surface and an internal surface, which is mounted on a second portion of the second end of the housing spaced from the first portion of the second end of the housing in a direction parallel to the path of movement of the indicating member, and which is disposed adjacent to the carried means and in a plane substantially perpendicular to the path of movement of the indicating member; the resetting cover being deformable toward the first portion of the second end of the housing when a person or object pushed against its external surface, so that the internal surface of the resetting disc will contact the carried means when the resetting cover is deformed and will thereby cause the first end of the locking member to be pivoted through the predetermined arc.

---

**4,369,729**

## IMAGE RECORDING APPARATUS

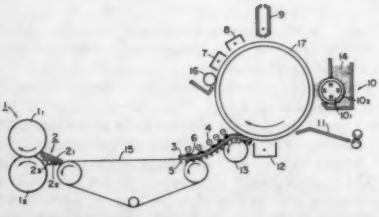
**Michio Shigenobu, Tokyo, and Masaharu Ohkubo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 10, 1981, Ser. No. 291,632**

**Claims priority, application Japan, Aug. 18, 1980, 55-113228; Aug. 18, 1980, 55-113229**

**Int. Cl.³ B05C *11/00***

**U.S. Cl. 118—60** **20 Claims**



1. An image recording apparatus, comprising:

an image depositing station for providing an unfixed image on an image bearing member;

a fixing station for fixing the unfixed image on the image bearing member; and

a guiding member for guiding the image bearing member from said image depositing station to said fixing station, said guiding member including a portion which is slidingly contactable with the image bearing member and a portion which is not contactable therewith;

wherein said non-contact portion has a first resistivity, and said contact portion has a second resistivity which is lower than the first resistivity.

---

**4,369,730**

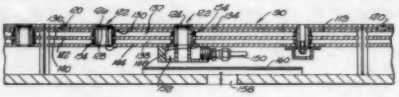
## CATHODE FOR GENERATING A PLASMA

**Masatsugu Izu, Birmingham; Timothy J. Barnard, Rochester, and David A. Gattuso, Pontiac, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.**

**Filed Mar. 16, 1981, Ser. No. 244,383**

**Int. Cl.³ C23C *11/00***

**U.S. Cl. 118—723** **12 Claims**



1. Apparatus for providing a substantially uniform supply of gas to a substrate comprising:

(a) a source of gas;

(b) a gas dispenser having a planar surface, said dispenser being engaged to said source;

(c) said surface being spaced from said substrate and including a first plurality of openings for delivering said gas thereto and a second plurality of openings for removing gas therefrom;

(d) gas evacuation means in communication with said second plurality of openings;

(e) a plurality of baffles arranged in substantially parallel relationship, each of said baffles having a plurality of apertures therein, the apertures of adjacent baffles being mismatched so that substantially equal gas path lengths exist from said source to said first plurality openings; and

(f) means for substantially equalizing the gas path lengths from said second plurality of openings to said gas evacuation means.

6. A cathode for use in generating a plasma by the application of an electrical field to a reaction gas comprising:

(a) a planar electrode;

(b) a source of electrical power engaged to said electrode;

(c) a source of reaction gas;

(e) said electrode having a first plurality of openings in communication with said source of reaction gas and a second plurality of openings in communication with said gas evacuation means said electrode;

(d) gas evacuation means;

(f) a plurality of baffles arranged in substantially parallel relationship, each of said baffles having a plurality of apertures therein, the apertures of adjacent baffles being mismatched so that substantially equal gas paths exist from said source to said first plurality of openings; and

(g) means for substantially equalizing the gas paths from said second plurality of openings to said gas evacuation means.

---

**4,369,731**

## COATING APPARATUS HAVING AN INTERNAL LEVELING BLADE

**Wayne A. Damrau, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.**

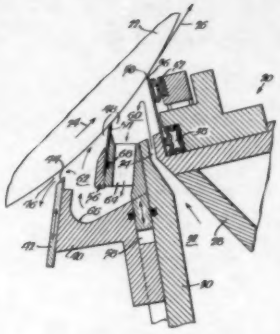
**Filed Sep. 2, 1981, Ser. No. 298,762**

**Int. Cl.³ B05C *5/02***

**U.S. Cl. 118—410** **4 Claims**

1. In an apparatus for applying a coating liquid to at least one face of a moving web of paper, wherein said apparatus has a

body portion having a chamber therein and an elongate opening to said chamber positionable generally adjacent to, below and transversely of the web and a coater blade extending from a rear or downstream side of said chamber opening substantially across and against the web, said chamber for receiving coating liquid under pressure and directing the same upwardly through said opening onto the web and said coater blade doctoring the coating liquid on the web, the improvement comprising a housing mounted on said body portion in said chamber intermediate said downstream side and an upstream side of said chamber opening and extending below and transversely across the web, and a leveling blade supported in and extending transversely along an upper end of said housing and extending upwardly through said chamber opening intermediate said downstream side and said upstream side thereof substantially across and against the web, said leveling blade leveling coating liquid applied on the web upstream thereof to cause coating penetration and filling of any voids and valleys in the web, said coater blade then doctoring coating liquid applied on the web downstream of said leveling blade, said leveling blade and said housing dividing said opening into an upstream coating liquid application zone between said upstream side of said opening and said leveling blade and housing and a downstream coating liquid application zone between said leveling blade and housing and said coater blade, said coating liquid in said chamber being introduced into said downstream application zone and said housing having at least one passage extending therethrough and providing communication between said downstream and upstream application zones for a flow of coating liquid from said downstream to said upstream application zone.



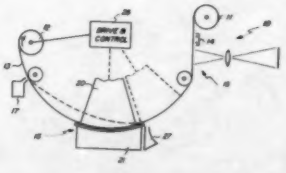
---

**4,369,732**

## IMAGING APPARATUS ADAPTED FOR DEVELOPING INTERMITTENTLY MOVING WEBS

**David R. Jackson, Rochester, and Allen J. Rushing, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 27, 1981, Ser. No. 239,221**
**Int. Cl.³ G03D 3/10; G03G 15/10**
**U.S. Cl. 118—681** **6 Claims**




1. In imaging apparatus of the kind having an operative path, including imaging and development zones, along which successive portions of a strip of imaging material can be moved for forming a succession of images and along which such movement may be continuous or intermittent, an improved development device comprising:

(a) development means, disposed along said path at said development zone from a strip ingress to said development zone to a strip egress from said development zone, for developing images on said material moving therepast along said path;

(b) transport means for moving such material through said development zone; and

(c) development control means, movable along said development zone, for: (1) in a first condition, constraining material in said development zone into developing relation with said development means from said ingress to said egress, (2) in response to cessation of material movement, releasing successive portions of material in said zone from said development relation, sequentially from said egress to said ingress and (3) in response to recommencement of material movement, re-establishing constraint of said material to said first condition sequentially from said ingress to said egress.

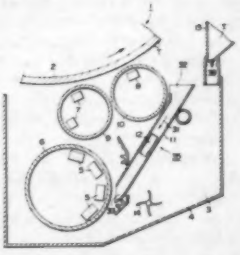
---

**4,369,733**

## TONER CONCENTRATION CONTROL APPARATUS

**Koji Hirakura, Yokohama; Yasuo Sawada, Sayama; Kenta Watase, Tokyo, and Takahiko Kitamura, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Nov. 3, 1980, Ser. No. 203,808**
**Claims priority, application Japan, Nov. 7, 1979, 54-143960**
**Int. Cl.³ G03G 15/09, 21/00**
**U.S. Cl. 118—691** **9 Claims**



1. A toner concentration control apparatus for controlling the concentration of toner in a dry type developer comprising at least toner and carrier for use in an electrophotographic copying apparatus comprising:

toner concentration detection means for outputting a current signal consisting of A.C. component signals and D.C. component signals, which A.C. component signals and D.C. component signals are in accordance, respectively, with the flow of said developer through a light-transmitting toner concentration detector portion of said toner concentration detection means, and the toner concentration of said developer, by illuminating said developer as it flows through said detector portion and converting light reflected by said developer to current signals;

A.C. and D.C. component signal separation means for separating said A.C. component signals from said D.C. component signals in said current signal;

developer-flow-abnormality detection means for indicating that the flow speed of said developer is out of a predetermined range, by comparing the level of said separated A.C. component signal with said developer flow reference signal; and

toner replenishment means for replenishing toner to said developer or stopping replenishment thereof in accor-

dance with the level of said D.C. component signals as compared with a predetermined D.C. component level.

---

**4,369,734**

## VARNISHING ASSEMBLY IN A PRINTING PRESS HAVING SELF-CLEANING FEATURE

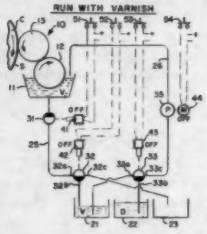
**Friedrich Preuss, Dreieich/Sprendlingen, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany**

**Filed Mar. 11, 1981, Ser. No. 242,659**

**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 8007271[U]**

**Int. Cl.³ B05C *1/02***

**U.S. Cl. 118—702** **5 Claims**




2. A varnishing assembly in a printing press for applying a layer of varnish to a sheet on a press cylinder comprising, in combination, a varnish fountain including a tray and fountain roller, an applicator roller interposed between the fountain roller and the cylinder, a varnish storage tank, a fresh detergent storage tank, a used detergent storage tank, the tray having an outlet line and an inlet line, the outlet line having a two-position shut-off valve and the inlet line having a pump and pump drive motor, a two-position three-connection drain valve having (1) an inlet connected to the outlet line of the tray, (2) a first outlet connected to the varnish tank and (3) a second outlet connected to the used detergent tank, a two-position three-connection fill valve having (1) a first inlet connected to the varnish tank, (2) a second inlet connected to the fresh detergent tank and (3) an outlet connected to the tray inlet line, control means including switches having "on" and "off" positions and clustered at a remote control location for energizing the valves and the pump motor to produce a cleaning cycle in which (a) unused varnish is drained from the tray into the varnish tank, (b) fresh detergent is pumped to the tray from the fresh detergent tank for cleaning up the residual varnish, and (c) the used detergent is drained from the tray into the used detergent tank.

---

**4,369,735**

## MOVING DAM WATERWAY CLEANER

**Neil Van Gaalen, P.O. Box 578, Glenwood Springs, Colo. 81601**

**Filed Apr. 21, 1981, Ser. No. 256,013**

**Int. Cl.³ A01K *63/00***

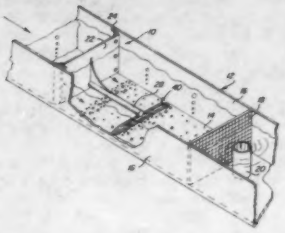
**U.S. Cl. 119—3** **11 Claims**

1. A cleaning device for elongated water channels having a bottom and a pair of opposite side walls, comprising:

(a) dam means for, in use, retaining a head of water flowing through said channel therebehind to propel the device;

(b) support means attached to said dam means for maintaining the dam means in water-head retaining position while permitting the movement of the dam means along the elongated channel; and

(c) wherein the dam means defines a water passageway substantially along the bottom edge thereof, said water passageway being in communication with the rear face of the dam means for, in use, receiving water under the pressure of the retained water head and discharging the



water forwardly of the dam means and against the channel bottom.

---

**4,369,736**

## INTAKE AIR HEATER

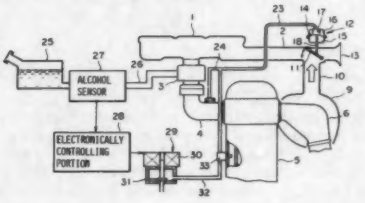
**Sumio Ito, Gotenba, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Apr. 27, 1981, Ser. No. 257,619**

**Claims priority, application Japan, Oct. 30, 1980, 55-151391**

**Int. Cl.³ F02B *75/12***

**U.S. Cl. 123—1 A** **9 Claims**




1. An intake air heater comprising:

an alcohol sensor for detecting the concentration of alcohol in a fuel containing alcohol;

a control valve for controlling the flow rate of hot air being introduced into an intake system; and

a control means responsive to said alcohol sensor for increasing the opening of said control valve as the concentration of alcohol in the fuel increases.

---

**4,369,737**

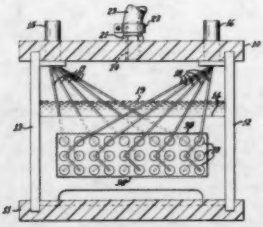
## HYDROGEN-OXYGEN GENERATOR

**Cledith A. Sanders; Margaret M. Sanders, and Cledith A. Sanders, II, all of 7391 Wending Ct., S., Jacksonville, Fla. 32210**

**Filed Jun. 2, 1980, Ser. No. 155,788**

**Int. Cl.³ F02B *43/08***

**U.S. Cl. 123—3** **12 Claims**



1. An accessory system to an internal combustion engine

comprising a cell for generating hydrogen and oxygen gas to be burned in said engine after being introduced into the carburetor of the engine, said cell comprising a nonconductive gas-tight housing having a hydrogen and oxygen exit port adjacent the top of said housing; a plurality of regularly spaced parallel metallic electrode rods positioned substantially parallel to the bottom of said housing; means for supporting said electrode rods within said housing in a plurality of horizontal rows with each of said rows being spaced vertically from each other and with their ends being in spaced vertical planes; an aqueous electrolyte immersing all of said electrode rods; means for interconnecting at their said ends in one said plane one half of said rods to a source of direct current electricity to render same positive and for interconnecting the other half of said rods at their ends in the other said plane to ground to render same negative; said rods being positioned such that each positive electrode rod is adjacent solely to said negative electrode rods and each negative electrode rod is adjacent solely to said positive electrode rods; said plurality of electrode rods being encircled by at least one layer of nonconductive netting having openings of $\frac{1}{8}$ to $\frac{1}{4}$ inch for collecting small gas bubbles being produced and causing same to coalesce into larger gas bubbles which quickly rise through and escape from said electrolyte; and a conduit attached to said exit to conduct a mixture of hydrogen and oxygen gas from said cell to said carburetor.

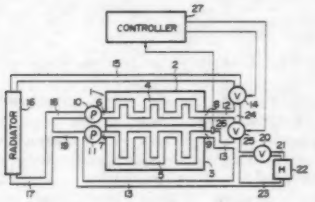
---

**4,369,738**

## ENGINE COOLING SYSTEM WITH OPTIONALLY COMMUNICABLE HEAD COOLING CIRCUIT AND BLOCK COOLING CIRCUIT, AND METHOD OF OPERATING THE SAME

**Tsutomu Hirayama, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed May 18, 1981, Ser. No. 264,866**
**Claims priority, application Japan, May 21, 1980, 55-68036**
**Int. Cl.³ F01P** *3/02, 7/16*
**U.S. Cl. 123—41.1** **26 Claims**




**1.** For an internal combustion engine comprising:

(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;

(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and

(c) a radiator formed with an inlet and an outlet;

a cooling system, comprising:

(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;

(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;

(f) a block output fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket, and for generating a sensed block output temperature signal representative of said temperature;

(g) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;

(h) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;

(i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, said downstream part of said block recirculation conduit system being thereby communicated also to said cylinder head inlet of said head cooling jacket;

(j) a first conrol valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;

(k) a flow mixing conduit which communicates a part of said main recirculation conduit system with a part of said block recirculation conduit system;

(l) a second control valve for controlling flow of cooling fluid through said flow mixing conduit according to a block flow regulation signal;

and

(m) a controller, which receives said sensed block output temperature signal from said block output fluid temperature sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve;

(n) whereby said controller can vary the amount of cooling operation provided for said internal combustion engine, by varying the opening amount of said first control valve, thus varying the amount of cooling fluid passing through said radiator; and can also vary the amount of mixing between the cooling circuit for said cylinder head and the cooling circuit for said cylinder block, by varying the opening amount of said second control valve, thus varying the amount of cooling fluid passing through said flow mixing conduit.

**17.** A method for operating a cooling system having:

(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder heat outlet;

(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and

(c) a radiator formed with an inlet and an outlet;

a cooling system, comprising:

(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;

(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;

(f) a block output fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket, and for generating a sensed block output temperature signal representative of said temperature;

(g) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;

(h) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;

(i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, said downstream part of said block recirculation conduit system being thereby communicated also to said cylinder head inlet of said head cooling jacket;

(j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;

(k) a flow mixing conduit which communicates a part of said main recirculation conduit system with a part of said block recirculation conduit system;

(l) a second control valve for controlling flow of cooling fluid through said flow mixing conduit according to a block flow regulation signal;

and

(m) a controller, which receives said sensed block output temperature signal from said block output fluid temperature sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve;

(n) whereby said controller can vary the amount of cooling operation provided for said internal combustion engine, by varying the opening amount of said first control valve, thus varying the amount of cooling fluid passing through said radiator; and can also vary the amount of mixing between the cooling circuit for said cylinder head and the cooling circuit for said cylinder block, by varying the opening amount of said second control valve, thus varying the amount of cooling fluid passing through said flow mixing conduit, when said cooling system is filled with cooling fluid;

said method comprising the proceses, simultaneously performed, of:

(o) operating said first pump and said second pump;

and

(p) depending upon said sensed block output temperature signal from said block output fluid temperature sensor, performing either one or the other but not both of the following two processes (q) and (r):

(q) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of less than a certain first predetermined temperature value, then simultaneously:

(q1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as substantially to interrupt flow of cooling fluid through said radiator; and

(q2) controlling said second control valve, by said block flow regulation signal, so as to allow a flow of cooling fluid through said flow mixing conduit;

(r) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of greater than said first predetermined temperature value, then simultaneously:

(r1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as to allow cooling fluid to flow through said radiator; and

(r2) controlling said second control valve, by said block flow regulation signal, so as to allow a controlled flow of cooling fluid through said flow mixing conduit;

(s) whereby, during the warming up process of said internal combustion engine, before the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket has attained said first predetermined temperature, the cooling systems for said cylinder head and for said cylinder block are substantially communicated, and no substantial cooling is provided for either by said radiator, so that the heat which is supplied to the cooling fluid within the head cooling jacket is communicated to the cooling fluid within the block cooling jacket, and both the cylinder head and the cylinder block are quickly warmed up together; but, after said cooling fluid which passes out through said cylinder block outlet of said block cooling jacket has attained said first predetermined temperature, then according to process (r1) substantial cooling is provided for the cooling fluid in said head cooling jacket, while according to process (r2) the amount of cooling provided for the cooling fluid in said block cooling jacket is regulated; whereby, after said internal combustion engine has been warmed up, said cylinder block may be kept substantially warmer than said cylinder head.

---

**4,369,739**

## STRUCTURE OF A CYLINDER ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

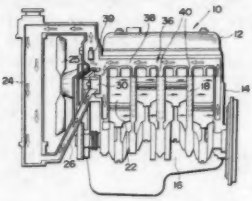
**Yukio Umemura, Yokosuka; Isao Yoshida, Fujisawa; Yoshio Taguchi, Yokohama, and Yoshio Iwasa, Nagareyama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed May 6, 1980, Ser. No. 147,336**

**Claims priority, application Japan, May 7, 1979, 54-60389[U]; Jun. 26, 1979, 54-87164[U]**

**Int. Cl.³ F01P** *3/02*

**U.S. Cl. 123—41.74** **17 Claims**




1. A cylinder assembly for an internal combustion engine comprising:

a cylinder block having a plurality of partitions arranged in parallel relationship with respect to one another and defining therebetween a plurality of combustion chambers arranged in-line, said cylinder block defining a coolant chamber for circulating an engine coolant therethrough;

a cylinder head mounted on said cylinder block and defining therein a coolant return passage for recirculating the engine coolant to a radiator for radiating the heat of the coolant;

a plurality of vertical passages defined in said cylinder block for communication between said coolant chamber and said return passage, said vertical passages being located at opposite ends of said partitions;

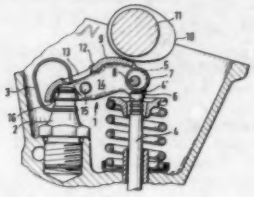
projecting portions provided on the internal periphery of certain associated ones of said vertical passages and protruding laterally toward said associated vertical passages, each of said projecting portions being located adjacent the upper end of said associated vertical passages and having an upper plane surface below said upper end, which plane surface is angled downwardly with respect to the horizontal and projects into the vertical passage; and

a plurality of communication passages defined in respective ones of said partitions for communication between vertical passages respectively located on opposite ends of said partitions, each said communication passage being respectively tilted so that the longitudinal axis thereof intersects said plane surface of said projecting portion at a right angle and the vertical dimension thereof extends at least over the upper half of one of said combustion chambers.

## 4,369,740
## VALVE-ACTUATING LEVER

Jiri Seidl, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 856,582, Dec. 1, 1977, abandoned. This application Feb. 21, 1980, Ser. No. 123,470
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654528
Int. Cl.³ F01L 1/20
U.S. Cl. 123—90.45 10 Claims



1. A valve actuating lever for internal combustion engines comprising lateral guide surface means on opposed sides of a valve abutment surface means of said lever, said valve abutment surface means being provided on a valve clearance adjusting means which is positioned between said lateral guide surface means and is fixedly clamped on opposed sides by said lateral guide surface means, a portion of said lateral guide surface means extending beyond said valve abutment surface means for guiding the lever along an abutting valve so as to secure the position of the lever during operation, wherein said valve clearance adjusting means is constructed as an eccentric element which is fixedly clamped on opposed sides by said lateral guide surface means, and in which the lateral guide surface means are components of flanges of a sheet metal stamping having an essentially U-shaped cross section and provided with a bearing plate constructed as an essentially closed ball socket with the flanges adjoining the ball socket on the side thereof toward said valve clearance adjusting means converging locally into mutual contact and being connected thereat with each other by a welded connection.

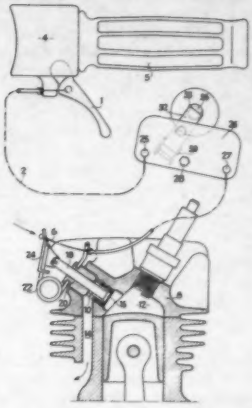
---

## 4,369,741
## DEVICE FOR AUTOMATICALLY CONTROLLING THE CLOSURE OF THE DECOMPRESSION VALVE OF AN INTERNAL COMBUSTION ENGINE

Marc Perrin, Genlis-Pluvault, France, assignor to Cycles Peugeot, Valentigney, France

Filed Dec. 3, 1980, Ser. No. 212,307
Claims priority, application France, Dec. 14, 1979, 79 30752
Int. Cl.³ F01L 13/08
U.S. Cl. 123—182 7 Claims

1. In a device for automatically ceasing the decompression of an internal combustion engine and comprising a decompression valve for the engine, which valve has a closing position and an opening position, a return spring combined with the valve for urging the valve to said closing position, manual actuating means movable between a closed valve position and an open valve position for shifting the valve to said opening position thereof in opposition to the effect of the spring, connecting means connecting the actuating means to the valve; the improvement comprising delay means for delaying the return of the valve to said closing position of the valve by the effect of said return spring when said actuating means is moved to said closed valve position, said delay means comprising a control member connected to the connecting means and movable by the connecting means substantially in a plane between a first position in which the valve is in the said opening position and a second position in which the valve is in said closing position, said spring being operative to bias the control member toward said second position, a finger member mounted on the control member to move transversely of said plane, a shaft for rotation by said engine when cranking the engine and defining a helical groove leading to an outer extremity of the shaft, the shaft being so positioned relative to the control member that the control member, in moving in a direction from said first position to said second position under the action of said spring, is operative to move the finger member toward and into lateral engagement with said helical groove so that the movement of the control member to said second position to



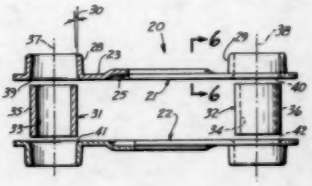
close the valve is blocked by said shaft and delayed until the finger member has travelled longitudinally along the shaft in the helical groove as the shaft rotates upon cranking the engine and has reached the outer extremity of the shaft, whereupon the finger member suddenly ceases to be blocked by said shaft and is free to move laterally beyond the shaft and allows the control member to move to said second position and suddenly close the valve.

---

## 4,369,742
## CONNECTING ROD FOR INTERNAL COMBUSTION ENGINE

Robert G. Everts, Mesa, Ariz., assignor to Piston Powered Products a division of RW Technologies, Inc., Tempe, Ariz.

Filed Jan. 24, 1977, Ser. No. 761,762
Int. Cl.³ F02B 75/32; G05G 1/00
U.S. Cl. 123—193 P 7 Claims



1. A connecting rod for an internal combustion engine comprising: a first and a second rod part, each of said rod parts having a central web, a pair of spaced-apart journal pads, a journal sleeve opening from each said pad, and a pair of bearing inserts including a central bearing passage having an axis and an outside wall, said outside wall being so proportioned as to make an interference fit in a respective journal sleeve of both of the rod parts, whereby the two parts are brought against each other into contiguity while embracing and holding the two bearing inserts with their axes parallel to form an assembled connecting rod, said rod parts being joined together

only through the bearing inserts, and being held to said inserts only by the interference fit they make with the inserts in final assembly.

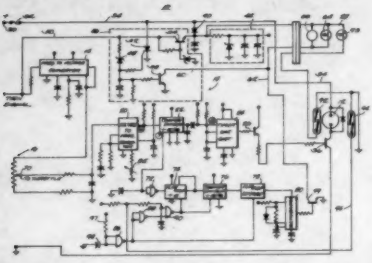
---

4,369,743

## ELECTRONIC LUBRICANT METERING SYSTEM

James L. Holt; John M. Mahoney, both of Bristol, Wis., and Kenneth M. McLeod, Lake Villa, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 22, 1981, Ser. No. 304,666
Int. Cl.³ F02B 33/04; F01M 1/00
U.S. Cl. 123—196 S 12 Claims



1. An electronic lubricant metering system for an engine comprising first means for producing a first electrical signal representative of engine RPM, second means for producing a second electrical signal representative of the amount of fuel being delivered to the engine, lubricant supply means for supplying a variable amount of lubricant into the fuel delivered to the engine, and electrical control means responsive to said first and second electrical signals for providing a control output which renders said lubricant supply means operative to vary the lubricant/fuel ratio of the lubricant and fuel mixture delivered to the engine.

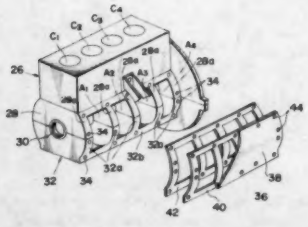
---

4,369,744

## LOW-NOISE LEVEL RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

Takao Kubozuka, and Hirofumi Takei, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 30, 1980, Ser. No. 173,837
Claims priority, application Japan, Aug. 2, 1979, 54-98873
Int. Cl.³ F02B 77/00
U.S. Cl. 123—198 E 13 Claims



1. A reciprocating piston internal combustion engine comprising:

a cylinder block having engine cylinders formed therein;

a crankshaft housing mounting on said cylinder block for positioning a crankshaft therein, said housing including an upper section with downwardly extending partition walls and a lower section with upwardly extending partition walls integrally connected to a common bottom wall, said sections being coupled whereby said downwardly extending partition walls are mated with corresponding upwardly extending partition walls thereby forming open chambers separated by said mated downwardly and upwardly extending walls, each of said mated walls being formed for supporting a journal of said crankshaft; and

a sound-insulating panel attached to said crankshaft housing in a manner to sealingly enclose openings of all of said open chambers thereby permitting said chambers to serve as lubricant reservoirs.

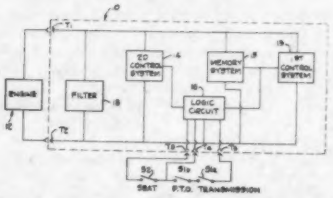
---

4,369,745

## SAFETY INTERLOCK FOR MACHINE AND ENGINE WITH MAGNETO IGNITION

William A. Howard, Troy Township, Geauga County, Ohio, assignor to Delta Systems, Inc., Twinsburg, Ohio

Division of Ser. No. 969,871, Dec. 15, 1978, Pat. No. 4,294,327.
This application Apr. 9, 1981, Ser. No. 252,368
Int. Cl.³ F02B 77/00
U.S. Cl. 123—198 DC 4 Claims



1. A safety interlock for controlling the starting and running of an internal combustion engine that has a magneto ignition system with a primary winding that can be shorted to prevent ignition, said interlock comprising: a first switch means for electrical connection across a primary winding of an ignition system, normally nonconductive and capable of being rendered conductive by an electrical signal; a second switching means for electrical connection across the primary winding, normally nonconductive and capable of being rendered conductive by an electrical signal; a first control circuit for said first switching means, including first safety switch means for actuation in response to the condition of apparatus driven by said engine, said first safety switch means having a first condition that allows the first switching means to become conductive upon engine starting and a second condition that prevents it from becoming conductive, and circuit means responsive to running of the engine to prevent the first switching means from becoming conductive while the engine is running; a second control circuit including said first safety switch means and a second safety switch means, said first safety switch means in its second condition preventing the second switching means from becoming conductive, and said second safety switch means having a first condition that prevents the second switching means from becoming conductive and a second condition that allows the second switching means to become conductive if the first safety switch means is in its first condition.

---

4,369,746

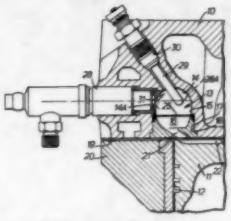
## CATALYTIC COMBUSTION ENGINES

Robert H. Thring, Steyning, England, assignor to Ricardo Consulting Engineers Limited, Sussex, England

Filed Sep. 5, 1980, Ser. No. 184,373
Claims priority, application United Kingdom, Aug. 23, 1979, 7929332; Sep. 5, 1979, 7930836
Int. Cl.³ F02B 19/08
U.S. Cl. 123—261 16 Claims

1. A liquid-fuelled reciprocating-piston I.C. engine with catalytic ignition and combustion, which comprises at least one cylinder and a cylinder head, a precombustion chamber associated with said cylinder and formed in the cylinder head, a

combustion space in the cylinder above the piston, a restricted transfer passage connecting the precombustion chamber with said combustion space and positioned such that at least a part of the total air charge in the combustion space is forced through the transfer passage under pressure to enter the precombustion chamber tangentially during each compression stroke of the piston in such a manner that the charge in the precombustion chamber is caused to swirl around the interior of the chamber, and further comprising injection means for injecting liquid fuel into the precombustion chamber shortly before top-dead-centre in each compression stroke, and a catalytic element in the precombustion chamber by which combus-



tion of the air/fuel mixture is initiated and promoted in the precombustion chamber, said catalytic element comprising a screen having a multiplicity of openings or passageways extending through its thickness through which gas can readily flow from one side to the other of the screen, the screen extending across the precombustion chamber to divide it into first and second separate volumes, said injection means being located to inject a fuel spray into said first volume at a point spaced from the screen and along a centre line whose projection does not intersect the screen, and said transfer passage leading into said second volume, the transfer passage joining the precombustion chamber at a region spaced from the catalytic e' ment.

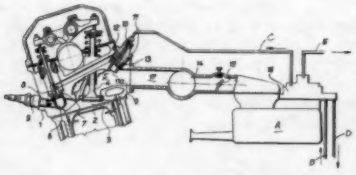
---

**4,369,747**

## METHOD OF AND APPARATUS FOR PREPARATION OF A COMBUSTION MIXTURE FOR ENGINES WITH DIVIDED COMBUSTION SPACE

**Stanislav Jahoda, Horni Pocernice, Czechoslovakia, assignor to Ustav pro vyzkum motorovych vozidel, Prague, Czechoslovakia**

**Filed Feb. 28, 1980, Ser. No. 125,514**
**Int. Cl.³ F02B *17/00*; F01L *3/22***
**U.S. Cl. 123—278** **12 Claims**



**1.** In an apparatus for preparing combustible mixtures with different air-fuel mixing ratios for an internal combustion engine having a main combustion chamber with a main suction channel and a subsidiary combustion chamber with a subsidiary suction channel, the improvement which comprises a suction valve provided in each of the main and the subsidiary suction channels, the main suction channel forming part of the suction tract of the engine, a fuel nozzle generating a fuel jet terminating into the suction tract of the engine, a stub nipple encompassing the outlet of said fuel nozzle while remaining open into the suction tract of the engine, a sucking-off chamber provided around said stub nipple, openings formed in said stub nipple near the outlet of the fuel injection nozzle connecting the internal space of the stub nipple with the sucking-off chamber, the subsidiary suction channel connecting this sucking-off chamber with the subsidiary combustion chamber, means for igniting the combustible mixture in the subsidiary chamber, and a flashover channel connecting the subsidiary combustion chamber with the main combustion chamber.

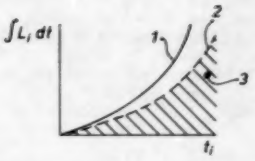
---

**4,369,748**

## OPTICAL ENGINE KNOCK SENSING SYSTEM

**Leo Steinke, Hepach; Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen; Klaus Müller, Tamm, and Franz Rieger, Aalen-Wasseralfingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 1, 1981, Ser. No. 268,856**
**Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023013**
**Int. Cl.³ F02P *5/04*; F02B *3/00*; G01K *21/26***
**U.S. Cl. 123—425** **15 Claims**




**1.** Optical knock sensor system having
an optical receiver-transducer **(10, 11, 12)** exposed to and receiving light occurring upon combustion of a fuel-air mixture in the cylinder of an internal combustion (IC) engine, and furnishing an electrical output signal ($L_i$) representative of sensed light;
means **(13–17)** sensing contamination of the receiver due to deposits on the receiver in the course of operation of the IC engine and providing a contamination output signal;
and means **(18, 19; 30, 32, 33)** controlling operation of the engine to cause the engine to operate under controlled knocking condition to thereby produce shock and oscillation waves in the combustion chamber and remove contaminants from the receiver.

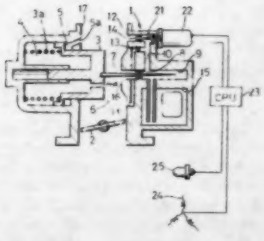
---

**4,369,749**

## VARIABLE VENTURI CARBURETOR

**Fumio Sugi, Handa, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Japan**

**Filed Jan. 27, 1981, Ser. No. 228,898**
**Int. Cl.³ F02M *7/00***
**U.S. Cl. 123—439** **5 Claims**



**1.** A structure in a variable venturi carburetor of an internal combustion engine for preventing fuel vapor bubbles to pass to a main fuel jet comprising: a venturi portion, a float chamber, a main fuel passage communicating with the venturi portion

and with the float chamber, the main fuel jet provided in the main fuel passage and a movable metering needle, a free end of said metering needle being adapted to control the size of the main fuel jet and a base portion of said metering needle being mounted to a suction piston adapted to transversely move with respect to the venturi portion in response to the condition of load on the internal combustion engine, an improvement including provision of a bypass detouring upwardly from a portion of the main fuel passage upstream of the main fuel jet for discharging the vapor of fuel, said bypass communicating with a negative pressure passage having an opening in a lower portion of said venturi portion and said bypass communicating also with an air passage having an opening in the vicinity of an air horn inlet.

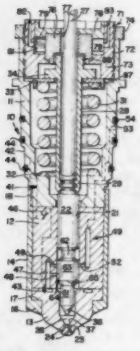
---

**4,369,750**

## FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINE

**George Muntean; Harry L. Wilson, and Gary L. Gant, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.**

**Filed Dec. 19, 1979, Ser. No. 105,150**
**Int. Cl.³ F02M *59/42***
**U.S. Cl. 123—505** **12 Claims**



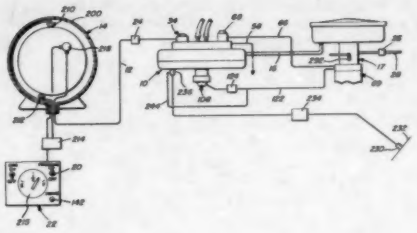
1. Apparatus for a fuel injector that includes an injector body having a plunger bore formed therein, a supply passage and a return passage formed in said body adjacent said bore, a metering orifice connecting said bore with said supply passage, and first and second return flow passages connecting the supply passage and the return passage with the bore, said return flow passages being adjacent each other but spaced from said orifice, said injector body having a forward end and spray holes connected to said bore adjacent said forward end, said apparatus comprising a generally cylindrical plunger adapted to reciprocate in said bore adjacent said orifice, said flow passages and said spray holes, said plunger having a reduced diameter end portion adjacent said forward end of said body, a cylindrical land formed on said plunger adjacent said reduced diameter end portion, a feed groove formed in said land, said feed groove extending to one edge of the land and opening to said reduced diameter end portion, said groove being adapted to connect with said orifice, and an annular return groove formed on said plunger adjacent said land and at a location which is displaced from said reduced diameter end portion and said feed groove, said return groove being disconnected from said feed groove and being adapted to connect with said first and second return flow passages in all modes of operation.

**4,369,751**

## LIQUEFIED PROPANE CARBURETOR MODIFICATION SYSTEM

**William H. Batchelor, Lantana, Fla., and Douglas R. Batchelor, Buchanan, Mich., assignors to Ayres Technologies, Inc., West Palm Beach, Fla.**

**Filed Aug. 13, 1980, Ser. No. 177,790**
**Int. Cl.³ F02B *43/00***
**U.S. Cl. 123—527** **12 Claims**



1. In an internal combustion engine having an engine block, at least one combustion chamber, an intake manifold for channeling fuel to said combustion chamber and a carburetor mounted on said intake manifold, the improvement comprising a storage tank for storing liquefied gaseous fuel; a regulator and vaporizer means for vaporizing said liquefied gaseous fuel and regulating the flow of said liquefied gaseous fuel, said vaporizer and regulator means including a first chamber for receiving said liquefied gaseous fuel from said tank, said first chamber having a first outlet port containing a gaseous fuel flow regulator, said first outlet port being connected to said intake manifold, and a second chamber containing a second outlet port, said second chamber being divided into upper and lower portions by a diaphragm, valve means actuated by said diaphragm for selectively communicating said second chamber with said first chamber; and mixer means connected to said carburetor, said mixer means having an inlet port connected to said second outlet port for receiving gaseous fuel therefrom and mixing said gaseous fuel with combustion air, said mixer means defining a venturi structure including large cross sectional area inlet and outlet ends and a smaller cross sectional area midportion intermediate said large cross sectional area ends and further defining a gas receiving chamber disposed substantially entirely about said venturi passage and with which said inlet port is communicated, said smaller cross sectional area midportion of said venturi structure including at least a substantially continuously peripheral slot formed therein opening outwardly from the outer periphery of said smaller cross sectional area midportion into the immediately surrounding portions of said gas receiving chamber and communicating the latter with the outer periphery of the smaller cross sectional area venturi midportion, said large cross-sectional area outlet end being communicated with said intake manifold and said large cross sectional area inlet end being adapted to receive filtered induction air.

---

**4,369,752**

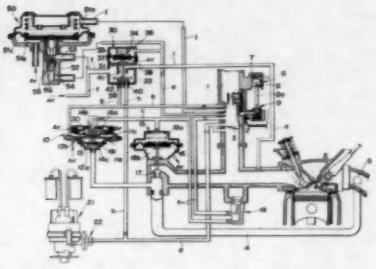
## EXHAUST GAS PURIFICATION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

**Kosuke Ito, Yokohama; Hiroshi Iida, Tokyo; Masanori Harada, and Masato Hatakenaka, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Sep. 24, 1980, Ser. No. 190,282**
**Claims priority, application Japan, Sep. 27, 1979, 54-125143**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—568** **4 Claims**

1. An exhaust gas purification control apparatus for an internal combustion engine comprising:

(a) an air-fuel mixture control responsive to a first vacuum signal;
(b) an exhaust gas recirculation control responsive to a second vacuum signal;
(c) an ignition timing control responsive to a third vacuum signal;



(d) a vacuum signal modifier for controlling at least two of said first, second, and third vacuum signals in response to a pressure signal applied thereto; and
(e) a pressure control device for controlling said pressure signal applied to said vacuum signal modifier.

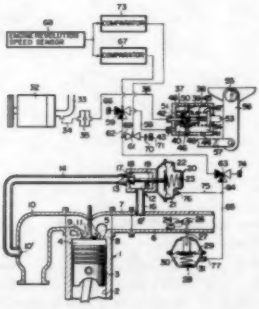
---

**4,369,753**

## PRESSURE MEDIATED DIESEL ENGINE EXHAUST GAS RECIRCULATION CONTROL SYSTEM

**Toshihisa Sugiyama, Gotenba, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 12, 1980, Ser. No. 215,848**
**Claims priority, application Japan, Jul. 25, 1980, 55-102030**
**Int. Cl.³ F02M** *25/06*
**U.S. Cl. 123—569** **16 Claims**



1. For a diesel internal combustion engine comprising:
(a) an air intake system;
(b) an exhaust system;
(c) an exhaust gas recirculation conduit, a first end of which is connected to said exhaust system and a second end of which is connected to an intermediate part of said air intake system, for recirculating exhaust gases from said exhaust system to said air intake system; and
(d) a movable member which moves according to the amount of diesel fuel being supplied to said diesel internal combustion engine;
an exhaust gas recirculation control system, comprising:
(e) an exhaust gas recirculation control valve, comprising a first diaphragm chamber, provided in said exhaust gas recirculation conduit so as to regulate the flow of exhaust gas through said exhaust gas recirculation conduit, whose resistance to flow of exhaust gas varies according to the value of a controlling fluid pressure supplied to said first diaphragm chamber;
(f) a throttle valve fitted to said intake system upstream of said second end of said exhaust gas recirculation conduit;
(g) a fluid pressure control valve, which regulates a fluid pressure supply and produces said controlling fluid pressure, according to the amount of displacement of said movable member;
(h) a fluid pressure actuated diaphragm device, comprising a second diaphragm chamber which is supplied with said controlling fluid pressure from said fluid pressure control valve, which moves said throttle valve according to the value of said controlling fluid pressure;
whereby the amount of exhaust gas recirculation provided by said exhaust gas recirculation control valve is varied according to the amount of diesel fuel being supplied to said diesel internal combustion engine; and,
by suitably tailoring the characteristics of said fluid pressure control valve with regard to the output controlling fluid pressure produced for a given amount of displacement of said movable member, the performance of exhaust gas recirculation provided by said exhaust gas recirculation control valve with respect to the amount of diesel fuel being provided to said diesel internal combustion engine may be suitably tailored; and
whereby no great driving load need be put upon said movable member, such as would be imposed, if said movable member were directly mechanically coupled to a valve element of said exhaust gas recirculation control valve and said intake system throttle valve is moved so as to throttle said intake system more or less and thereby so as to produce more or less intake system vacuum in the neighborhood of said second end of said exhaust gas recirculation conduit, whereby exhaust gas recirculation through said exhaust gas recirculation conduit is desirably more or less promoted.

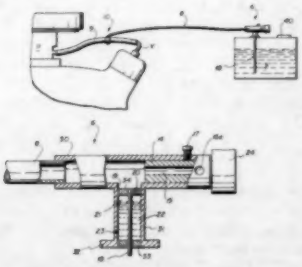
---

**4,369,754**

## VACUUM RESPONSIVE INJECTION SYSTEM FOR ENGINES

**Bob Lofman, P.O. Box 128, Grass Valley, Calif. 95945**

**Filed Nov. 4, 1980, Ser. No. 203,854**
**Int. Cl.³ F02M** *12/22*
**U.S. Cl. 123—573** **9 Claims**



1. A vacuum responsive injection system for engines comprising, in combination:
a vacuum conduit extending from a carburetor to a crankcase ventilation valve,
injection means in the vacuum conduit connected to a metering means through a tube,
said metering means operatively attached to a liquid containing reservoir whereby air and liquid are injected into the carburetor as an aerated liquid through the vacuum conduit after premixing with unburned oil-carbon crankcase

vapors in the vacuum conduit wherein said metering means comprises:

a horizontal chamber communicating with a vertical chamber which overlies said reservoir,

a pipe supported by said vertical chamber and extending from said horizontal chamber into liquid in said reservoir, said pipe isolated from an open area defined by said vertical chamber,

and an air bleed means in said horizontal chamber whereby liquid drawn up to said horizontal chamber by said pipe is mixed with air and carried to the carburetor.

---

**4,369,755**

## AIR CONTROL DEVICE

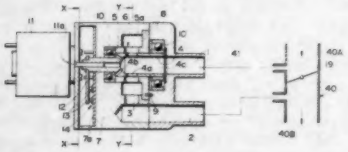
**Masaaki Saito, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 13, 1980, Ser. No. 178,238**

**Claims priority, application Japan, Aug. 23, 1979, 54-116165[U]**

**Int. Cl.³ F02M *7/24***

**U.S. Cl. 123—588** **12 Claims**



1. An air control device for regulating the air flow, comprising:

an induction passage;

a throttle valve placed in the induction passage;

an air passage bypassing the throttle valve so that the air flow through the bypassing air passage can increase during engine warm-up;

a main body having a portion of said air bypassing passage extending therethrough, one end of said air bypassing passage being connected to the induction passage on the upstream side of the throttle valve and the other end of said air bypassing passage being connected to the induction passage on the downstream side of the throttle valve;

a shutter mechanism contained within said main body for rotatably regulating the air flow through said air bypassing passage, said shutter mechanism being provided with a fixed cylindrical means and a rotatable cylindrical means having communicating axial and transverse holes so as to define the effective area of the air flow; and

a mechanism for rotatably actuating said shutter mechanism to regulate the effective area of one of said holes.

---

**4,369,756**

## PLASMA JET IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

**Mitsuhiko Ezoe, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Jan. 7, 1981, Ser. No. 223,086**

**Claims priority, application Japan, Jan. 11, 1980, 55-1258; Feb. 22, 1980, 55-21170[U]**

**Int. Cl.³ F02P *1/00, 7/02, 19/02, 3/04***

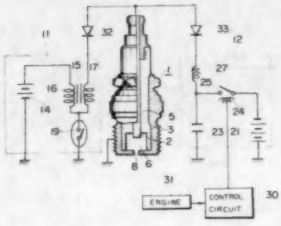
**U.S. Cl. 123—620** **15 Claims**

1. A plasma jet ignition system for an internal combustion engine, said system comprising:

a plasma jet spark plug having positive and negative electrodes forming a spark gap therebetween, and an insulating body surrounding said spark gap to form a discharge cavity with a spout orifice to eject a plasma gas produced in said discharge cavity,

a first ignition energy source connected for supplying electric energy to said plug to perform a spark ignition,

a second ignition energy source connected for supplying electric energy to said plug to perform a plasma jet ignition in addition to the spark ignition,




an energy restriction circuit means for detecting an engine cranking period and for restricting the energy supply from said second ignition energy source to said plug during the engine cranking period to reduce energy consumption during cranking.

---

**4,369,757**

## PLASMA JET IGNITION SYSTEM

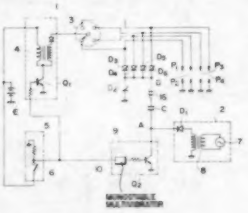
**Makoto Anzai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Feb. 25, 1981, Ser. No. 238,092**

**Claims priority, application Japan, Feb. 29, 1980, 55-24968**

**Int. Cl.³ F02P *3/08***

**U.S. Cl. 123—620** **5 Claims**



1. A plasma jet ignition system comprising:

a plurality of spark plugs;

means for generating an ignition timing signal;

a high tension electric power source;

a device connected to said high tension electric power source and said plurality of spark plugs for supplying a spark ignition current to said spark plugs selectively in accordance with said ignition timing signal;

a low tension electric power source;

a first diode;

a plurality of second diodes corresponding in number to said plurality of spark plugs;

a plasma energy storing capacitor having one terminal connected to said low tension electric power source and its other terminal connected to ground via said first diode and to said plurality of spark plugs via said plurality of second diodes, respectively; and

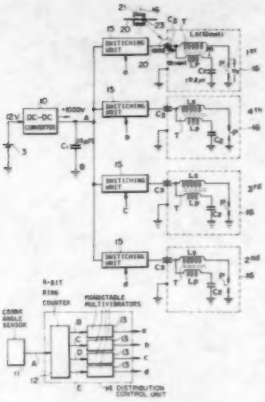
switching means connected to said one terminal of said capacitor for grounding said one terminal in synchronism with said ignition timing signal so as to discharge electric energy stored in said capacitor to supply a plasma ignition current to that one of said plurality of spark plugs which is supplied with said spark ignition current in accordance with said ignition timing signal.

4,369,758

## PLASMA IGNITION SYSTEM

Hiroshi Endo, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 17, 1981, Ser. No. 303,024
Claims priority, application Japan, Sep. 18, 1980, 55-128596
Int. Cl.³ F02P 1/00
U.S. Cl. 123—620 16 Claims



1. A plasma ignition system for an internal combustion engine which comprises:

(a) a plurality of plasma spark plugs, one terminal of each being grounded;

(b) a DC—DC converter for boosting a DC supply voltage to a high tension;

(c) an ignition energy condenser for storing electric ignition energy, said ignition energy condenser being connected to the output of said DC—DC converter;

(d) a plurality of switching units each for applying the ignition energy charged in said ignition energy condenser to the respective plasma spark plug with an appropriate ignition timing, said switching units being connected to said ignition energy condenser;

(e) a plurality of boosting transformers each for boosting the voltage across said ignition energy condenser to a still higher voltage, the common terminal of the respective primary and secondary coils being connected to said respective switching units, the other terminal of the respective secondary coil being connected to the terminal of said respective plasma spark plug other than the grounded terminal; and

(f) a plurality of auxiliary condensers each for connecting the other terminal of the primary coil of said respective boosting transformer to the ground, said auxiliary condensers forming an oscillation circuit together with the primary coil of said boosting transformer,

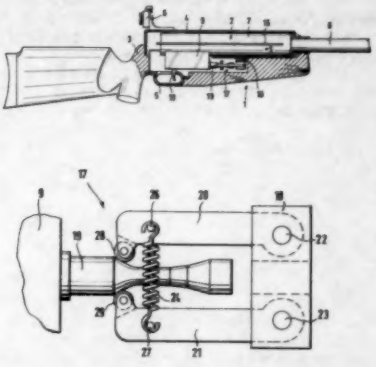
whereby when said switching unit is turned on in order to discharge a current from said ignition energy condenser to said auxiliary condenser through the primary coil, a high tension is generated at the secondary coil of said boosting transformer so as to generate a spark between the electrodes of said plasma spark plug and subsequently a large current is passed through the electrodes of said plasma spark plug by the remaining plasma ignition energy stored in said ignition energy condenser so as to produce a plasma therebetween for completing the plasma ignition.

4,369,759

## RECOILLESS AIR WEAPON

Friedrich Gerstenberger, Dürnau, and Ludwig Jaedicke, Ulm, both of Fed. Rep. of Germany, assignors to Anschutz GmbH, Ulm, Fed. Rep. of Germany

Filed Sep. 9, 1980, Ser. No. 185,554
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936883
Int. Cl.² F41b 11/00; F41f 19/00, 19/06
U.S. Cl. 124—68 6 Claims



1. In a sporting air gun in the nature of a recoilless pressurized-air weapon, said weapon including a gunstock with a barrel and firing mechanism mounted thereon, said weapon further having a recoilable system which is translatably mounted so as to slide forward and backward on the gunstock of the weapon in a direction which is generally longitudinal, and which recoilable system compensates by opposed motion the impulse from the firing of the weapon, said system minimally comprising a breech casing to which the barrel, the firing mechanism, and added masses are attachable to increase the weight of the system, and said system having a center of mass lying off the line of action of the impulse resulting from the firing, whereby a torsional impulse is superposed on said firing-resultant impulse;

the improvement comprising at least one torsional impulse generator positioned functionally with the weapon, which generator forms an autonomous functioning unit with other parts of the weapon, the torsional impulse resulting from said generator being simultaneous with and directed opposite to the torsional impulse which is induced by the recoilable system in the firing phase of operation, and said torsional impulse from the generator acting substantially in the same direction as said torsional impulse from the recoilable system;

wherein the torsional impulse generator is a device which produces a force which acts oppositely, respectively, on the recoilable system and the gunstock, the line of action of which force is relatively far from the center of mass of the system but close to the center of mass of the gunstock;

wherein the device is a driven cam transmission operating according to the principle of an inclined plane; and

wherein the cam transmission is a longitudinally profiled control-surface rod, the profile of said rod being in the form of surface segments of different slope, whereby at least one cam follower lever in the form of a dog follows the different levels of the profile segments when the system and gunstock are in relative motion, and the drive of the cam transmission comprises at least one spring which presses the at least one dog against the control-surface rod in the region of the surface segments, which segments are sloped with respect to the longitudinal direction, the control-surface rod being affixed to one of the recoilable

system and the gunstock, and the the dogs are affixed to the other of the gunstock and recoilable system.

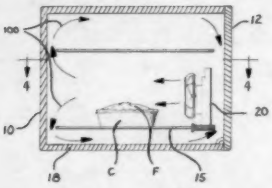
---

**4,369,760**

## PORTABLE OVEN AIR CIRCULATOR

**Jorgen A. Jorgensen, Bloomington, and Donald W. Nygren, Minneapolis, both of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.**

**Filed Sep. 22, 1980, Ser. No. 189,661**
**Int. Cl.³ D24C *15/32*; A21B *1/00***
**U.S. Cl. 126—21 A** **3 Claims**




1. A compact portable air circulator for use in a cooking oven to increase the rate and uniformity of cooking and baking which comprises:

(a) a fan blade of heat resistant material,

(b) a metal housing,

(c) a gear reduction train within the housing connected to the fan blade,

(d) a spring motor within the housing connected to the gear reduction train to drive the fan, and

(e) a large flat horizontal oven rack clamp for positive engagement with a wire oven rack and which clamp also serves as a base for the air circulator so that it might stand upon a horizontal surface in said oven.

---

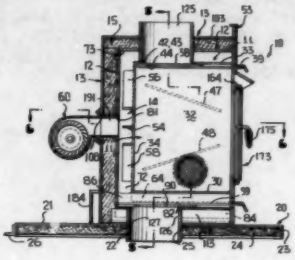
**4,369,761**

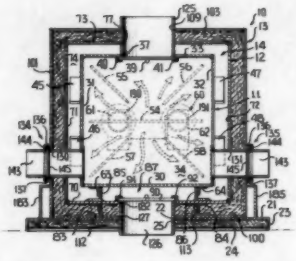
## WOOD BURNING STOVE

**Clarence S. Burnette, No. 20 Woodwinds, Montaque Rd., Greenville, S.C. 29609**

**Filed Jun. 9, 1980, Ser. No. 157,683**
**Int. Cl.³ F24C *1/14***
**U.S. Cl. 126—63** **5 Claims**

4. A solid fuel burning stove comprising first and second means for defining an innermost combustion chamber in generally spaced relationship to an outer hot-air circulating chamber, said chambers having adjacent spaced rear and bottom walls, an opening in said rear wall of outer hot-air circulating chamber through which air is adapted to be introduced into the space between said chambers, an opening in said bottom wall of said outer hot-air circulating chamber from which hot-air is conducted for heating purposes, damper means for adjustably regulating the flow of hot-air outwardly of said outer hot-air circulating chamber opening, means defining a hot-air passage between said bottom walls for directing hot-air between and along said bottom walls toward said outer hot-air circulating chamber opening, said hot-air passage means are a pair of generally parallel spaced walls between which is positioned said hot-air circulating chamber opening, and said combustion





chamber bottom wall is supported upon upper edges of said parallel walls.

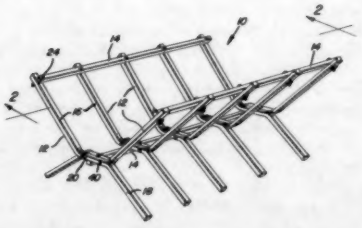
---

**4,369,762**

## SOLID FUEL SUPPORTING GRATE FOR FIREPLACE

**Tony Ziebert, 1513 W. Washington St., Stayton, Oreg. 97383**

**Filed Mar. 18, 1981, Ser. No. 245,211**
**Int. Cl.³ F23H *13/00***
**U.S. Cl. 126—164** **10 Claims**



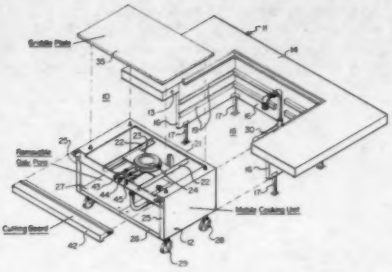
1. A fireplace grate for solid fuel, such grate including a plurality of pairs of crossed and front-to-rear reversed elongated support members each including generally parallel opposite end portions interconnected by an angulated mid-portion, said support members of each pair of support members being oppositely inclined with their mid-portions generally horizontally disposed and secured together in side-by-side horizontally aligned relation, said pairs of support members being laterally aligned in horizontally spaced relation, and elongated horizontal connecting members extending between and connecting corresponding portions of said pairs of support members.

**4,369,763**

## COOKING TABLE

**James E. Sullivan, 100 Westport Dr., Pittsburgh, Pa. 15238**

**Filed Aug. 29, 1980, Ser. No. 182,790**
**Int. Cl.³ F24C *1/16***
**U.S. Cl. 126—276** **4 Claims**




1. In a cooking table of the type comprising a stationary portion with a flat top and supporting means therefor, at which persons may be seated, and a mobile unit portion on castors having cooking means at the top, which portion is movable into relation with the stationary portion, the improvement wherein the stationary portion has a table top in the form of a U, the supporting means comprise sidewalls depending from the table top around the inside of the U, the stationary portion carries a trough attached to said sidewalls extending inwardly into the inside portion of said U on all three sides thereof, said table top overhangs all of said sidewalls outwardly from the U so that persons may be seated for dining around the outside of the U on all three sides thereof, the top of said mobile portion corresponds in dimensions to those of the interior of said U, the cooking means comprise a griddle plate and means for heating same, said mobile portion is movable wholly into said interior so that the griddle plate thereof adjoins flush with the table top of the stationary portion and overhangs said trough whereby drippings from the portion of the griddle plate overhanging said trough fall into the trough, said griddle plate having open grooves on the underside thereof spaced from and parallel to the edges thereof and disposed above said trough when said mobile portion is disposed in said interior of the U whereby drippings from said edges of the griddle plate are prevented from running on the underside of the griddle plate beyond said grooves, and said mobile portion has three sidewalls of insulating material depending from its top which adjoin the sidewalls respectively of the stationary portion when the mobile portion is moved into said interior of the U of said stationary portion.

---

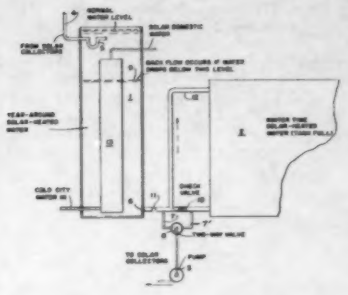
**4,369,764**

## SOLAR HEAT STORAGE SYSTEM

**Harry E. Thomason, and Harry J. L. Thomason, Jr., both of 609 Cedar Ave., Fort Washington, Md. 20022**

**Filed Oct. 29, 1980, Ser. No. 201,748**
**Int. Cl.³ F24H *7/00*; F17D *1/00***
**U.S. Cl. 126—400** **17 Claims**

1. A liquid solar-heat storage tank system comprising a first tank and a second tank, means inter-connecting said tanks comprising liquid conduits including a first branch line connected adjacent to the bottoms of said tanks, a check valve in said first branch line closable to prevent flow from said first tank to said second tank and openable to permit flow from said second tank to said first tank, and a second branch line connected adjacent to the bottom of said first tank and the top of said second tank to permit liquid to flow from the bottom portion of said first tank to the top portion of said second tank when the level of liquid in said first tank is higher than the level




of liquid in said second tank and higher than the highest point of said second branch line.

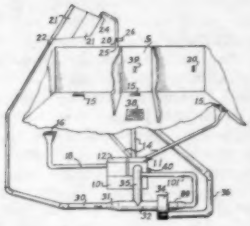
---

**4,369,765**

## SUPPLEMENTAL HEATING SYSTEM USING SOLAR RADIATION

**Grady L. McDaniel, 207 Valley Rd., Lawrenceville, Ga. 30245**

**Filed Jun. 11, 1980, Ser. No. 177,252**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—427** **8 Claims**



1. A supplemental heating system, for use with a conventional heating system including a furnace, a plenum carried by said furnace for receiving air heated by said furnace, supply ducts in communication with said plenum for distributing said air to a space to be heated, and a furnace thermostat in said space for causing said furnace to operate when said space is below a predetermined temperature, said supplemental heating system including a blower having a low pressure side and a high pressure side, a first duct in communication with said low pressure side, a branch duct in communication with said plenum and said first duct, means connecting said high pressure side of said blower to said space to be heated, supplemental heating means for supplying heat to said first duct, timing means for determining periods of possible operation of said supplemental heating system, and thermostatic means for disabling said supplemental heating means when the temperature of said plenum is above a predetermined temperature, the arrangement being such that, during a period of possible operation of said supplemental heating system said furnace will operate in accordance with said furnace thermostat and said supplemental heating system will warm said space so long as sufficient heat is available through said supplemental heating system, said blower of said supplemental heating system removing heated air from said plenum and said supply ducts for distribution through said supplemental heating system.

4,369,766

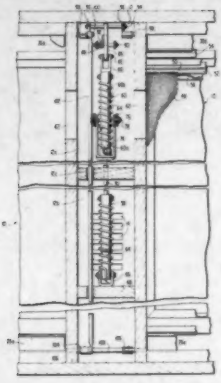
## SOLAR HEATING AND SHADING WINDOW HAVING AUTOMATIC TEMPERATURE-RESPONSIVE DAMPER SYSTEM

John L. Coley, 1147 Nance Dr., Madison, Ala. 35758

Filed Jan. 21, 1980, Ser. No. 113,955

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—429 13 Claims



1. A window having a solar plenum and having outside and inside air passages adapted for communication with the solar plenum, and thermally sensitive means operable to close the solar plenum to create a dead air space and to place said plenum in communication with the outside or the inside air passages responsive to temperature differentials in the outside or inside air and in said solar plenum, and said thermally sensitive means having communication with the outside or inside air and with the solar plenum, and said thermally sensitive means comprising a pair of dampers forming movable closures for the solar plenum, and actuating linage means adjacent to the window and being drivingly connected to said dampers, and said linkage means including a pair of independent actuators sensitive to temperature changes and being arranged in two separate chambers, one of said actuators being arranged in one of said chambers adjacent to and separated from the solar plenum, said one chamber having aperture means in communications with the outside or inside air, and the other of said actuators arranged in the solar plenum.

---

4,369,767

## ENDOSCOPE SYSTEM

Yoshio Shishido, Soka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 14, 1980, Ser. No. 149,925

Claims priority, application Japan, May 25, 1979, 54-64671; May 25, 1979, 54-64672; May 25, 1979, 54-64674; May 25, 1979, 54-64675

Int. Cl.³ A61B *1/04*; G03B *37/00*

U.S. Cl. 128—6 7 Claims

1. An endoscope system for use with a camera unit, comprising:

an endoscope including an insertion section to be inserted into a body cavity, an ocular section coupled with said insertion section, and a light guide and a first image guide extending through said insertion section, one end of said first image guide being located at said ocular section;

a light source unit for supplying flash light to said light guide of said endoscope;

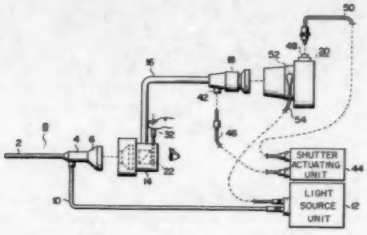
means for splitting light transmitted through said first image guide into two light paths;

viewing means for viewing a region of interest of the body cavity through said first image guide and said light splitting means, said viewing means being disposed on one light path of said light splitting means;

an additional image guide disposed on the other light path of said light splitting means, whereby an image of the region of interest is transmitted through said first and additional image guides and said light splitting means;

a housing for receiving said light splitting means and holding said viewing means and said additional image guide, said housing being attached to said ocular section;

light shutting means which is selectively operable for shutting or intercepting the light from said light splitting




means toward said viewing means, said light shutting means being located in said one light path between said light splitting means and said viewing means;

camera mounting means for mounting said camera unit, said camera mounting means being coupled with said additional image guide; and

camera unit actuating means responsive to operation of said light shutting means to a light intercepting position for releasing the shutter of said camera unit after the light is shut off or intercepted by said light shutting means, and for thereby causing flash light to be supplied from said light source unit.

---

4,369,768

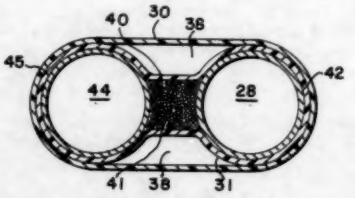
## ARTHROSCOPE

Marko Vukovic, 2052 Lincoln Park West, Chicago, Ill. 60614

Filed Jul. 30, 1980, Ser. No. 173,952

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 2 Claims




1. An arthroscope for use in diagnostic and surgical procedures involving an injured area, such as the knee and surrounding tissue, comprising:

a body portion;

a probe portion;

a viewing portion secured to generally opposite sides of said body portion, said arthroscope configured to provide a line-of-sight from said viewing portion to said probe portion provided through said body portion, said probe portion including a tubular instrument conduit for carrying a selected surgical instrument for operative procedures in the injured area, and a tubular viewing conduit of substantially the same diameter through which the injured area proximate to the probe tip may be viewed; said instrument

conduit and said viewing conduit secured parallel to one another, said conduits secured to each other along their length and separated by a hollow joining member to form a substantially dumbbell-shaped cross-section;

a removable sheath configured to surround said probe along its length, said sheath being made of a compliant material and configured slightly undersized with respect to the transverse dimensions of said probe, so that said sheath when affixed over said probe conforms to the exterior of said instrument and viewing conduits in a fluid-tight manner, but leaving a pair of clear channels between said sheath and said joining member;

means for sealably connecting the instrument-insertion end of said instrument conduit to a source of irrigating liquid, so that with said sheath removed and no instrument in said instrument conduit, said instrument conduit may serve as an alternate irrigation channel for purely diagnostic observation;

clear passage valve means disposed in communication with said instrument conduit with the passage axis of said valve means aligned with the center axis of said instrument conduit, so that with said valve in the open position an inserted instrument can pass the length of said instrument conduit unobstructed by said valve means, and so that with said instrument removed, actuation of said valve means alternatively to an open or closed condition controls the flow of irrigation liquid when said instrument channel is serving as said alternate irrigation channel;

second valve means for connecting said sheath to a source of irrigation fluid to control the supply of said irrigating fluid to the area under inspection through said pair of clear channels; and,

illumination means in said probe for illuminating the area to be inspected, said illumination means including a plurality of fiber optic strands disposed within said hollow joining member so as to convey light from a source thereof to the tip of said probe.

---

**4,369,769**

## SPINAL FIXATION DEVICE AND METHOD

**Charles C. Edwards, 3907 Greenway, Baltimore, Md. 21218**

**Filed Jun. 13, 1980, Ser. No. 159,396**
**Int. Cl.³ A61F *5/01***
**U.S. Cl. 128—69** **17 Claims**

1. A surgically implanted spinal fixation support system comprising at least one metal rod, a plurality of anchoring devices for securing said metal rod to a patient's spine, and at least one sleeve member fitting around the rod, disposed between the anchoring devices, the sleeve members not associated with any anchoring devices for providing an adjustable area of pressure application to the spine, the sleeve comprising a biologically compatible non-metal material and having a longitudinal bore therethrough, the bore being of a substantially equal diameter throughout its length, the bore being approximately the outside diameter of said rod and for the purpose of fitting the sleeve around the rod and an outside diameter which is small enough in size so as to enable the rod to be surgically fixed with the sleeves to the spinal column of a patient and the thickness of said sleeve being large enough to make bone contact with the spine. to hold the spine in a normal or anatomic position.

---

**4,369,770**

## SURGICAL STRUT FOR TREATMENT OF THE BACK-BONE

**Kazimierz Bacal, Gora; Lech B. Wierusz, Swiebodzin, and Janusz Miszczyk, Zielona Gora, all of Poland, assignors to Wyzsza Szkola Inzynierska Im. J. Gagarina, Zielona Gora, Poland**

**Filed Jul. 22, 1981, Ser. No. 285,698**
**Claims priority, application Poland, Jul. 30, 1980, 226000**
**Int. Cl.³ A61F *5/01***
**U.S. Cl. 128—69** **3 Claims**

1. A surgical strut for treatment of the back-bone, consisting of a rod having a round cross-section, and of hooks mounted thereon, characterized by that at one end of the rod (1) it is provided with a number of through holes (5) perpendicular to the rod axis, aimed at mounting a thrust pin (4), whereby the axes of neighbouring holes form an angle of 90°, and one of the hooks (3) is from the side of the front face provided in the wall of the round hole with four recesses disposed on the periphery of the hole every 90°, constituting the seats for the thrust pin (4).

---

**4,369,771**

## PENILE ERECTILE SYSTEM

**Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.**

**Filed Sep. 24, 1981, Ser. No. 305,048**
**Int. Cl.³ A61F *5/00***
**U.S. Cl. 128—79** **2 Claims**

1. A penile implant comprising an elongated unitary body having a tip portion at one end, an anchoring stem portion at the other end; an intermediate portion having an inner chamber and a radially disposed outer chamber, said inner chamber being non-distensible so that when pressurized and filled with fluid it becomes rigid; a passage providing communication between said inner and outer chambers; pump means within the body for transferring fluid to the inner chamber to pressurize it and make it rigid; and a pressure control valve for controlling the pressure in said inner chamber, said pressure control valve comprising:

(a) a valve jacket having an inlet and an outlet, said inlet communicating with the inner chamber, and the outlet communicating with the outer chamber;

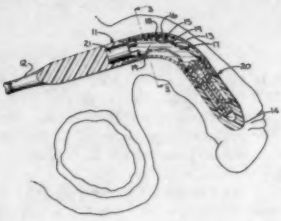
(b) a valve housing positioned in said jacket, said housing having an open top and bottom and an inwardly directed shoulder partially closing said top;

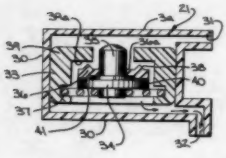
(c) a poppet mounted in said housing between the inlet and the outlet; said poppet having a base with an upwardly extending stem;

(d) a seal member positioned on top of said poppet, said

member having a sealing edge which extends circumferentially about said stem;

(e) means exerting a force upon said poppet urging it toward the open top of the housing so that the sealing edge will be in sealing contact with the underside of the shoulder





closing said valve, said valve being openable by exerting manual pressure on the stem to reduce the pressure in the inner chamber of the penile implant and automatically openable when the pressure in the inner chamber exceeds the force exerted on said poppet.

---

**4,369,772**

**METHOD FOR STRENGTHENING A FRACTURED BONE**

**Gary J. Miller, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.**

**Filed Apr. 28, 1980, Ser. No. 144,052**

**Int. Cl.³ A61F *5/04***

**U.S. Cl. 128—92 C** **6 Claims**

1. Method for strengthening a bone which comprises the steps of:

a. opening the body to gain access to one end of said bone;

b. drilling a passageway along the axis of the medullary canal of said bone;

c. inserting into said passageway a substantially elongated inflexible open-ended, hollow, bone-reinforcing, tubular member having an outside diameter less than the diameter of said passageway;

d. injecting into one end of said tubular member after the inserting step c sufficient hardenable semisolid mixture of methyl methacrylate and poly (methyl methacrylate) under superatmospheric pressure to embed said tubular member in said bone by passage of said mixture from the hollow of said tubular member to fill the remaining portions of said passageway, and to fill any cavity in said bone intersected by said passageway with said hollow remaining filled with said mixture;

e. allowing sufficient time for said mixture to harden in and around said tubular member; and

f. closing said body.

**4,369,773**

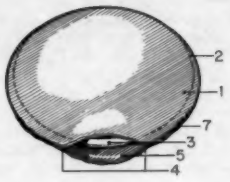
**CONTRACEPTIVE SPONGE - DIAPHRAGM BILAYER**

**Milos Chvapil, 5655 N. Mina Vista, Tucson, Ariz. 85718**

**Filed Nov. 5, 1980, Ser. No. 204,294**

**Int. Cl.³ A61F *5/46***

**U.S. Cl. 128—127** **2 Claims**



1. Formation of a contraceptive sponge bilayer product consisting of:

(a) two layers of sponges having the shape of a circular disc, the diameter of about 5 to 11 cm and of the thickness of about 0.15 to 0.3 cm

(b) the said sponges, laminated on one side with a thin plastic membrane attached to the sponge surface by an adhesive

(c) connecting the two laminated sponges together at the circumference of the discs to form a pocket having the plastic membrane inside, the sponge layer outside and leaving an opening into the pocket about 3 to 4 cm wide

(d) incorporating into the sponge an effective spermicide dissolved in a buffered solution of pH 3 to 5

(e) the said solution containing 5 to 20 volume percent glycerin or similar plasticizers and

(f) inserting into the pocket of the laminated sponge bilayer a silastic ring

---

**4,369,774**

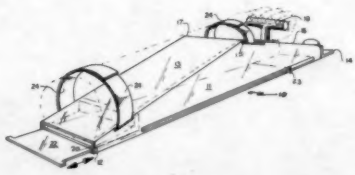
**ARTERIAL ARM BOARD**

**Richard F. Robbins, Salt Lake City, Utah, assignor to Frederick F. Auerbach, Salt Lake City, Utah, a part interest**

**Filed Mar. 16, 1981, Ser. No. 243,784**

**Int. Cl.³ A61F *13/00***

**U.S. Cl. 128—133** **8 Claims**



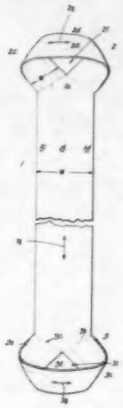
1. An arm board for use in connection with piercing a human radial artery at the underside of the wrist comprising a first inclined ramp, a second inclined ramp and a hand grip mounted on said second ramp so that it can be gripped by a hand of a patient, said first and second ramp being joined together at their upper ends to form a fulcrum, said first ramp being of length sufficient to support substantially the full length of a forearm between elbow and wrist and said second ramp being of length to provide support to the back of a hand below the wrist, said first and second ramps defining at said fulcrum an angle such that when a patient's forearm and hand are supported on said ramps and the hand grip is grasped the wrist is thereby hyperflexed to present the radial artery for penetration.

4,369,775

## MULTI-PURPOSE ANATOMICAL SUPPORT WRAP

Paul B. Gamm, Cincinnati, Ohio, assignor to Jung Products, Inc., Cincinnati, Ohio

Filed Mar. 6, 1981, Ser. No. 241,081
Int. Cl.³ A61F 13/06
U.S. Cl. 128—166 14 Claims



1. An anatomical support wrap comprising

an elongated strap like body portion having first and second ends, said body portion being made of a longitudinally stretchable material, said body portion having a longitudinal central zone and two longitudinal edge zones, and said central zone being adapted to exert a greater degree of tension than said edge zones when said wrap is stretched during use, and

first and second strap like loop portions affixed to said body portion, each of said loop portions comprising a strap like member having first and second ends, said first and second ends of each of said first loop portion being attached to said first end of said body portion, and said first and second ends of said second loop portion being attached to said second end of said body portion.

---

4,369,776

## DERMATOLOGICAL IONIZING VAPORIZER

Wallace A. Roberts, 88 N. Main St., Bellingham, Mass. 02019

Continuation-in-part of Ser. No. 29,004, Apr. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 757,039, Jan. 5, 1977, abandoned. This application Feb. 19, 1981, Ser. No. 235,855
Int. Cl.³ A61N 1/44
U.S. Cl. 128—200.14 1 Claim

1. A dermatological ionizing vaporizer comprising:

a. a fluid container;

b. an electric heating coil, to vaporize the fluid within said container;

c. delivery means to direct the vaporized fluid to the exterior of said vaporizing unit;

d. entry means for the delivery therethrough of fluid into said fluid container;

e. disabling means to stop operation of said heating coil when the fluid in said fluid container reaches a predetermined low level, including:

a power source having a voltage output that decreases when put under load;

a thermistor, positioned within a lower level of said fluid container in parallel with the power source, said thermistor being sensitive and responsive to surrounding medium temperature such that increases in temperature decrease resistance therein so as to cause voltage from the power source to decrease when temperature of the thermistor increases;

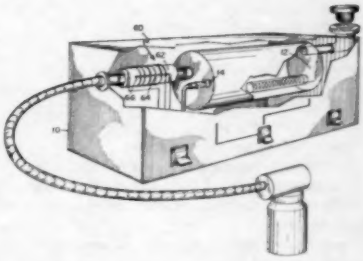
a first transistor switch, the input of which is in parallel with the thermistor and the power source so that the input receives a temperature indicative signal that decreases with increasing temperature, such transistor normally being in a conductive state unless the temperature of the thermistor exceeds a predetermined threshold;

a first relay having a coil in the output circuit of the first transistor switch, and contacts that are closed when the first transistor switch is in a conductive state, such contacts being opened when the first transistor switch is in a cut-off state, said first transistor switch thereby opening the contacts of the first relay when temperature of the thermistor exceeds the predetermined threshold;

a triac, the output of which is in series with the heating coil, and the input of which is connected so as to receive power only when the first relay's contacts are closed, such triac thereby powering the heating coil only when the first transistor switch is in a conductive state and thus only when temperature of the thermistor has not exceeded the predetermined threshold;

f. means, for warning of low water level, including

a second transistor switch having an input connected to the output of the first transistor switch;



a second relay the coil of which is connected to the output of the second transistor switch, such coil being energized when the temperature of the thermistor has exceeded the predetermined threshold and the second transistor switch is in a conductive state; and

an electric lamp connected in series with contacts of the second relay, so that the lamp is powered when temperature of the thermistor has exceeded the predetermined threshold;

g. means for ionizing said vaporized fluid when it is traveling through said delivery means including:

an ionizing electrode coil member; and

circuitry for stepping up voltage to said ionizing electrode coil member including a silicon-rectifier controlled capacitive discharge circuit; and

h. means for timing operation of the unit including:

a counter-display system, having an output voltage indicative of whether a pre-set interval of time has expired;

a third transistor switch, the input of which is connected to the output of the counter-display system;

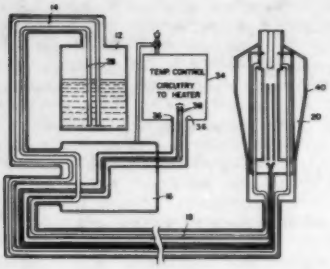
a third relay, having a coil in the output circuit of the third transistor switch, and capable of being actuated upon conductance of a predetermined current through the third transistor switch's output, and having normally open contacts in series with the contacts of the first relay and the heating coil, so that the heating coil is powered only during the interval timed by the counter display system.

4,369,777

## APPARATUS FOR TREATMENT OF THE COMMON COLD AND ALLERGIC RHINITIS

Andre Lwoff, Paris, France; Aaron Yerushalmi, Rehovot, Israel; Irun R. Cohen, Rehovot, Israel; Gideon B. Moshe, Rishon Le Zion, Israel, and Jack Pennell, Sutton Coldfield, England, assignors to Yeda Research & Dev., Co., Ltd., Rehovot, Israel

Filed May 8, 1981, Ser. No. 261,981
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—200.14 13 Claims




1. Apparatus for delivering a stream of heated humidified air to the nasal mucosa for treatment of the common cold or of allergic rhinitis, the apparatus comprising:

a container adapted to contain water;

means for producing a supply of air under pressure;

pressurizing means for applying at least a part of said supply of air under pressure to said container for causing a pressurized flow of water to issue therefrom;

a remote outlet member comprising

inlet means for receiving at least a portion of said supply of air under pressure and said pressurized flow of water from said pressurizing means and said producing means;

outlet means;

a conduit connecting said inlet means, said pressurizing means and said producing means;

means for heating at least a portion of said supply of air; and

means for supplying said pressurized flow of water to said supply of air after said air is heated for providing a humidified heated stream of air;

said outlet member being adapted for positioning with respect to a user such that said outlet means is in a non-contacting adjacent position with respect to the nasal mucosa of a user for directing said humidified heated stream of air toward said nasal mucosa.

---

4,369,778

## METHOD AND APPARATUS FOR A PORTABLE RESPIRATOR

Amos Norris, Box 638, and Edwin J. Dorius, 103 W. Juniper La., both of Gillette, Wyo. 82716

Filed Apr. 8, 1981, Ser. No. 252,234
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—205.13 6 Claims

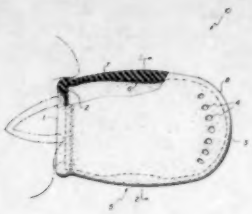
1. A portable respirator comprising in combination:

a container having an enlarged opening adapted to fit over the mouth area of a person requiring resuscitation,

a plurality of unrestricted fenestrations closely placed together and disposed on an end of said container remote from said enlarged opening,

said fenestrations grouped in such a manner that the palm area of a rescuer's hand can cover all fenestrations,

and a resilient deformable body portion extending from said end to said opening whereby when said fenestrations are



closed by occlusion with the palm, the fingers can deform said body portion to provide an air pulse to the person.

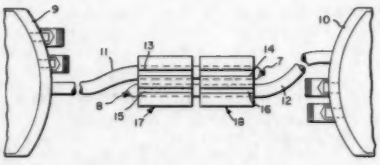
---

4,369,779

## STERILE DOCKING PROCESS, APPARATUS AND SYSTEM

Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 236,855, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 167,716, Jul. 11, 1980, abandoned. This application Jun. 4, 1981, Ser. No. 267,291
Int. Cl.[3] A61M *5/00*; B29C *27/00*
U.S. Cl. 128—213 A 24 Claims




1. A process of joining first and second thermoplastic tubes together transversely of the axis of each tube comprising urging a hot cutting means through each tube and simultaneously forming a continuous molten seal between a heated cutting surface and a transverse section of each said tube thereby maintaining a seal between the interior and exterior of said tubes aligning said tubes with each other and, joining the respective molten ends of said tubes together to form a joint between said tubes, both while maintaining said seal.

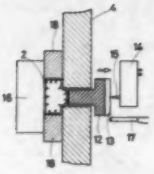
8. An apparatus for forming a sterile connection comprising a cutting means, means adapted to heat said cutting means, a pair of mounting blocks adapted to receive and hold two tubes to be joined, means to provide movement between said blocks and said cutting means to a position such that the cutting means is between said blocks and traversing where the blocks are adapted to receive tubes, means adapted to realign said blocks to a position where two different tube ends are aligned with and facing each other and means to separate said blocks and said cutting means while urging said blocks together.

**4,369,780**

## BLOCKING CONDITION DETECTION DEVICE IN A MEDICAL FLUID INJECTION SYSTEM

**Eiichi Sakai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 21, 1980, Ser. No. 180,388**
**Claims priority, application Japan, Aug. 24, 1979, 54-108489**
**Int. Cl.³ A61M 5/00**
**U.S. Cl. 128—214 E** **7 Claims**



1. A medical fluid injection system comprising:
a flexible conduit;
supply means for supplying a pressurized medical fluid through said flexible conduit; and
a blocking condition detection means for detecting an abnormal blocking condition in said flexible conduit, said blocking condition detection means including
support means provided with an opening for supporting said flexible conduit, said flexible conduit being conformed by said support means into a substantial rectangular configuration juxtapositioned to said opening,
rod means slidably disposed through said opening; and
detection means for detecting a shift in movement of said rod means;
one end of said rod means being in contact with said flexible conduit at the location of said rectangular configuration and the other end of said rod means being in contact with said detection means such that, upon the detection of a blocking condition within said conduit manifested by an abnormal pressure within said conduit, said flexible tubing expands at the location of said rectangular configuration into said opening so as to depress and shift said rod means to make contact with said detection means, said rectangular configuration increasing the sensitivity of said detection means.

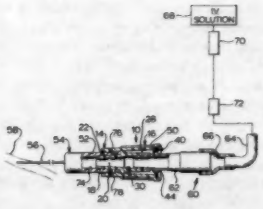
---

**4,369,781**

## LUER CONNECTOR

**Richard W. Gilson, Dellwood, Mo., and Edward F. Windischman, Waterbury, Conn., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.**

**Filed Feb. 11, 1981, Ser. No. 233,540**
**Int. Cl.³ A61M 5/00; F16L 25/00, 35/00**
**U.S. Cl. 128—214 R** **9 Claims**




1. A medical fluid coupler for connecting a first device having a female Luer lock connector to a second device having a male Luer slip connector comprising a body having a bore and including a male Luer lock connector at one end of said body for connecting the female Luer lock connector of the first device in fluid tight locking connection with said body and said bore, and another connector at the opposite end of said body including a female Luer slip connector having a Luer tapered bore in fluid communication with said first named bore for receiving the male Luer slip connector of the second device in fluid tight connection therewith and with said bore, said body having an outer wall surrounding said female Luer slip connector in radial spaced relation therewith, and retaining means connected adjacent said opposite end of said body for frictionally engaging and locking the male Luer slip connector of the second device against movement thereof away from said female Luer slip connector, said female Luer slip connector being flexible to permit limited angular movement thereof from its normal longitudinal axis when the male Luer slip connector is inserted therein.

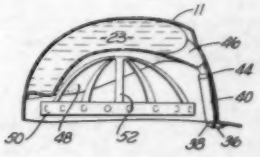
---

**4,369,782**

## EYEWASHING APPARATUS

**Terrill McGee, 525 South Ardmore, #208, Los Angeles, Calif. 90020**

**Filed May 15, 1981, Ser. No. 263,831**
**Int. Cl.³ A61M 7/00**
**U.S. Cl. 128—249** **9 Claims**



1. Apparatus for washing the eyes comprising:
a. a helmet;
b. said helmet including a region for storing a volume of eyewashing liquid; and
c. means for directing said eyewashing liquid from said region toward the eyes of a wearer.

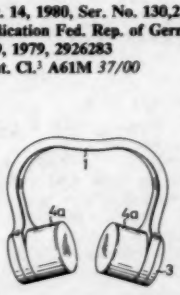
---

**4,369,783**

## DEVICE FOR THE PROPHYLACTIC OR THERAPEUTIC TREATMENT OF CATTLE

**Dietrich Hiller, Wiesbaden; Peter Klatt, Kelkheim, and Bernhard Reul, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 14, 1980, Ser. No. 130,218**
**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910629; Jun. 29, 1979, 2926283**
**Int. Cl.³ A61M 37/00**
**U.S. Cl. 128—260** **13 Claims**



1. A nose-clip for the prophylactic or therapeutic treatment of cattle, which comprises a bow portion the ends of which terminate in flattened surfaces provided with means for receiving active ingredients in the form of depot bodies, said bow portion being symmetrically shaped to lie in a first plane, each

end of the bow portion and said receiving means being inclined towards each other to form an inclination angle $\alpha$ with respect to the symmetrical axis of said bow portion and turned in the same direction from said first plane to form a torsion angle $\beta$ with respect to a plane normal to said first plane thereby insuring that the surfaces of any depot bodies mounted thereon are inclined towards each other and turned to face each other for positioning in the nasal vestibules of cattle.

---

**4,369,784**

## METHOD FOR MAKING SUPPOSITORIES BY COMPRESSION AND PRODUCT OF SAME

**Alain de Bumar, Düdingen; Aldo Riva, Berne, and Heinz Sucker, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland**

**Continuation of Ser. No. 27,427, Apr. 5, 1979, abandoned. This application Dec. 9, 1980, Ser. No. 214,747**

**Claims priority, application Switzerland, Sep. 29, 1978, 10194/78**

**Int. Cl.³ A61J *3/08*; B29B *3/00*; B29C *11/00***

**U.S. Cl. 128—271** **13 Claims**

1. A compression process for the production of a suppository comprising forming a granulate mixture of a conventional suppository base and a pharmacologically active agent, said mixture being free from added binder, and compressing said mixture while maintaining said mixture at a temperature not greater than 10° C.

7. The process according to claim 1 wherein the suppository base and the pharmacologically active agent and first granulated together before being compressed.

---

**4,369,785**

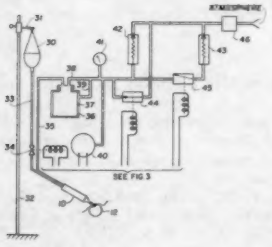
## SURGICAL FLUID FLOW SYSTEM

**Paul G. Rehkopf, Murrysville, and Ronald Zdrojkowski, Pittsburgh, both of Pa., assignors to Contemporary Ocu-Flo, Inc., Hollywood, Fla.**

**Filed Feb. 21, 1980, Ser. No. 123,487**

**Int. Cl.³ A61M *1/00***

**U.S. Cl. 128—276** **10 Claims**




1. A fluid flow system adapted to be used with an ophthalmic instrument having an influent flow channel and an effluent flow channel comprising:

an influent flow subsystem including a fluid reservoir, means for adjusting the differential pressure between said fluid reservoir and said influent flow channel, and means for controlling the flow of fluid from said fluid reservoir to said influent flow channel;

an effluent flow subsystem including means for applying a vacuum at said effluent flow channel, means for controlling the vacuum pressure at said effluent flow channel, and container means for collecting the effluent flow from said effluent flow channel, comprising a bottle having a cap thereon and a liner inserted therein, said liner being sealingly connected between said bottle and said cap, the interior of said liner and container being flow connected to said effluent flow channel of said instrument, and whereby the interior and exterior of said liner are flow connected to said vacuum means,

said fluid flow system further comprising means for selecting a first mode of operation comprising influent flow to said instrument, or a second mode of operation comprising influent flow to and effluent flow from said instrument, and means for purging air from between said fluid reservoir and said influent flow channel and for purging air from between said effluent flow channel and said effluent flow container means prior to using said instrument during surgery.

---

**4,369,786**

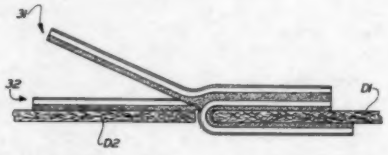
## REFASTENABLE ADHESIVE CLOSURE FOR DISPOSABLE DIAPERS OR BRIEFS

**Ezra D. Miller, Painesville, Ohio, assignor to Avery International Corporation, Pasadena, Calif.**

**Filed Jan. 26, 1981, Ser. No. 228,307**

**Int. Cl.³ A41B *13/02***

**U.S. Cl. 604—390** **2 Claims**




1. A refastenable tab of Y-configuration for diapers and the like formed of diaper tab stock comprising a web construction made up of initially flat but flexible substrate material and suitable to be formed in long passes along the machine direction of a coating and laminating line and to be rolled up for storage and shipment, and unrolled for use by diaper manufacturers, and fabricatable for storage and shipment completely by web coating and web-to-web laminating operations and without the necessity for folding or machine direction slitting operations, and suitable for high speed dispensing or automatic equipment, said tab including a first substrate extending, transversely to machine direction, along first and second length portions and bearing first substrate adhesive on its underside at both said first and second length portions, a second substrate extending along said first and second length portions and bearing second substrate adhesive on its underside at both said first and second length portions, release means for said first substrate adhesive located on said second substrate and below the first substrate adhesive at said second length portion, said first length portion being substantially free of said release means whereby said first substrate remains permanently associated with said second substrate throughout said first length portion up unto the border thereof that is adjacent said second length portion, said tab having two lateral sides formed by spaced transverse cuts across the machine direction of said tab stock, said tab also having an intermediate cut within the tab body, said intermediate cut extending generally intermediate said two lateral sides, and generally parallel thereto, said intermediate cut extending at least through said second length portion of said first substrate to define two side-by-side half-tab parts of said second length portions of said first substrate, each of a width to grip independently in a Y-configuration grip and each having its own part of said release means with said intermediate cut dividing said release means from itself to enable independent sequential deployment of said half-tab parts to sequentially form a first Y-configuration joint and a second Y-configuration joint.

4,369,787

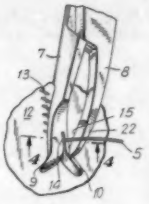
## METHOD OF CUTTING A SUTURE

Jeffrey I. Lasner, Purchase, and Francisco H. Aleixo, Tarrytown, both of N.Y., assignors to Laschal Instruments Corp., North Tarrytown, N.Y.

Division of Ser. No. 945,809, Sep. 26, 1978, Pat. No. 4,271,838, which is a continuation-in-part of Ser. No. 893,582, Apr. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 872,388, Jan. 26, 1978, abandoned. This application Oct. 30, 1980, Ser. No. 202,063

Int. Cl.[3] A61B *17/32*; A61F *17/32*

U.S. Cl. 128—318 2 Claims




1. A method of cutting a suture at least partly disposed in tissue and bearing a knot formed in the suture, comprising the steps of:

introducing the suture into the slot of an elongated suture cutter having a slotted member of a predetermined depth and a cutting blade relatively moveable with respect to the slotted member and substantially perpendicular to the elongation of the suture cutter, said introduction of the suture into the slot being performed by moving the suture cutter longitudinally parallel to its elongation so that the suture is thereby introduced into the slot which extends along the direction of elongation of the suture cutter;

moving the suture cutter along the suture within the slot until the member contacts the knot; and

moving the cutting blade across the slot and substantially perpendicular to the elongation of the suture cutter so as to cut the suture and automatically leave on the suture and adjacent the knot a stub substantially equal in length to the depth of the slotted member.

---

4,369,788

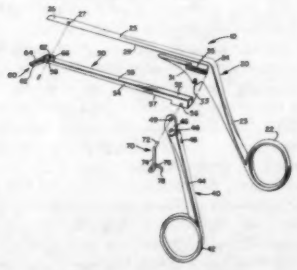
## REVERSED FORCEPS FOR MICRODISC SURGERY

Harold J. Goald, 4600 King St., Suite 5L, Alexandria, Va. 22302

Continuation of Ser. No. 117,203, Jan. 31, 1980, abandoned. This application Jul. 2, 1981, Ser. No. 279,836

Int. Cl.[3] A61B *17/28*

U.S. Cl. 128—321 7 Claims



1. A reversed grip microdisc forceps comprising:

a rigid member formed overall in the general shape of an obtuse angle with a shoulder portion at the angle, a handle and finger grip portion as one leg of the angle, hereinafter termed the rear leg and an arm portion as the forward leg of the angle said arm portion having a slide surface thereon on the side face thereof included within the obtuse angle and a fixed jaw at the forward end of said arm portion;

a handle and finger grip member positioned within the obtuse angle pivotally secured to the shoulder portion of said rigid member opposing the handle and finger grip rear leg;

a slidable arm positioned within the obtuse angle locked at the butt end thereof to said handle and finger grip member adjacent said aforementioned arm portion in an upper fixed arm, lower slidable arm relationship whereby pivoting said handle and finger grip member toward the handle and finger grip portion of said rigid member causes the slidable arm to move, said slidable arm having a first slide surface thereon along the top thereof matched to the aforementioned slide surface on the arm portion of said rigid member, said slidable arm having at least one second slide surface on the bottom thereof at the butt end thereof matched to the hereinafter defined slide surface on the shoulder portion of said rigid member;

said shoulder portion being bifurcated into upper and lower legs with the upper leg thereon being the arm portion of said rigid member, the lower leg thereon having thereon a slide surface matched to the said second slide surface on said slidable arm, the upper and lower legs on said shoulder portion providing therebetween above and below a slide slot into which the butt end of the slidable arm fits and wherein the slidable arm slides; and,

a pivotable jaw member hingedly attached to said slidable arm at the front end thereof opposite the fixed jaw within the obtuse angle therefrom, opening and closing to said fixed jaw as said slidable arm is caused to slide by pivoting movement of said handle and grip member.

---

4,369,789

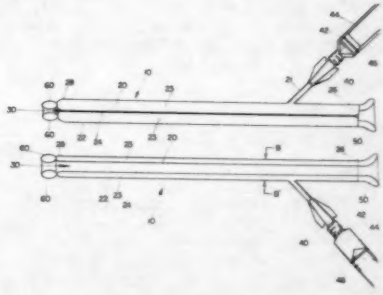
## INFLATABLE GASTRIC FEEDING TUBE

Eric G. LeVeen, 3-3 Woodlake Rd., Albany, N.Y. 12203; Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Jeannette L. Rubricius, 321 Confederate Cir., Charleston, S.C. 29407

Filed Dec. 10, 1980, Ser. No. 215,049

Int. Cl.[3] A61M *25/00*

U.S. Cl. 604—96 8 Claims



1. An oral-nasal gastric tubing apparatus comprising a flexible, cylindrical double walled tubing being of sufficient length for insertion through the nasal cavity of a patient and into the stomach of said patient, said double walled tubing being formed by inner and outer flexible concentric cylindrical walls, said inner wall of said tubing being expandible, said outer wall of said tubing being substantially non-expandible, said walls defining an inflation space therebetween, said inner wall surrounding and defining a throughgoing lumen, said walls being

sealed together at proximal and distal ends of said tubing with said lumen being open at said proximal and distal ends; valve means connected to said outer wall adjacent said proximal end and providing means for communicating with said inflation space, said valve means being adapted to receive inflation means, said distal end of said tubing being provided with weighted means to ease insertion of the tubing into a patient, said proximal end being provided with a funnel-shaped feed member allowing materials to be easily deposited within said lumen.

---

4,369,790

## CATHETER

John M. McCarthy, 192 Main St., Port Washington, N.Y. 11050

Filed Mar. 5, 1981, Ser. No. 241,001
Int. Cl.³ A61M 25/00
U.S. Cl. 604—280 11 Claims

1. A catheter comprising:
an elongated tubular member having a closed distal end and an open proximal end;
exactly two longitudinally extending slits in said tubular member adjacent the distal end thereof, one of said slits having a length greater than that of the other of said slits;
flexible means secured to the distal end and extending inside the tubular member towards the proximal end thereof for retracting said distal end with respect to said proximal end; and
actuator means secured to the free end of said flexible means for actuating said flexible means to retract said distal end with respect to said proximal end.

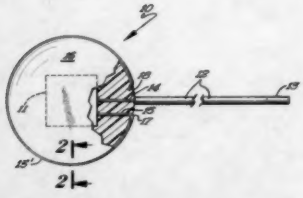
---

4,369,791

## BODY IMPLANTABLE ELECTRODE

Harry G. Friedman, Plymouth, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 80,539, Oct. 1, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,865
Int. Cl.³ A61N 1/04
U.S. Cl. 128—419 P 10 Claims



1. A body implantable stimulator which comprises:
stimulation impulse developing means;
generally disc-shaped means of an electrically insulating material housing said impulse developing means;
impulse delivering means incuding active electrode means carried by a lead extending from said housing; and,
annular indifferent electrode means carried at the periphery of said housing means, said indifferent electrode means being partially imbedded in said insulating material and having an exposed electrode-forming surface that is regular and large in relation to said active electrode.

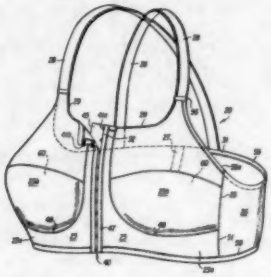
---

4,369,792

## BRASSIERE FOR SUPPORTING PROSTHESIS

Margaret Y. Miller, 4603 Westridge Pl., Temple Hills, Md. 20031

Filed Nov. 10, 1981, Ser. No. 319,370
Int. Cl.³ A41C 3/10
U.S. Cl. 128—479 9 Claims



1. A brassier for supporting a prosthesis on a woman after she has had breast surgery; the brassier comprising in combination:
a pair of front panels each having a bottom seam, a top seam and a free edge with a seam thereon forming the top and bottom seams wherein the top seam is spaced from the bottom seam by a distance sufficiently great for the front panel to overlie surgical scars high on the chest of the woman wearing the brassiere by extending substantially straight across the woman's chest substantially above the natural cleavage line;
back panel means, contiguous with the front panels, for connecting the front panels together and for extending under the arms and around the back of the woman wearing the brassiere; said back panel means being continuous and having a top and bottom seam, the top seam converging steeply toward the bottom seam whereby the back panel means is cut low with respect to the woman's arms to avoid any surgical incisions under the woman's arms;
cup means in each front panel for supporting either one of the woman's breasts or a prosthesis;
pocket means behind at least one of the cup means for containing a prosthesis, said pocket means being positioned substantially lower than the point at which the top seam joins the free edge of the front panel wherein the front panel is cut to fit with the top seam relatively high on the woman's chest relative to the pocket to cover any surgical scars on the woman's chest,
fastening means disposed adjacent to the free edges of the front panels for connecting the edges together whereby the brassiere fastens in the front, and
a flesh-toned, cotton cover for the prosthesis, the cover having a convex front surface and a pair of overlapping back flaps providing a closure through which the prosthesis is easily inserted and removed, the cover being used when wearing the prosthesis to prevent contact between the prosthesis and the woman's skin.

4,369,793

## MEDICAL INSTRUMENTATION ELECTRODE APPARATUS

Peter J. Staver, 1624 Detroit St., Lincoln Park, Mich. 48146, and Clinton Meyering, 15721 Richmond Ave., Southgate, Mich. 48195

Filed Aug. 18, 1980, Ser. No. 179,480
Int. Cl.³ A61B 5/04
U.S. Cl. 128—643 10 Claims

1. A medical instrumentation electrode apparatus, comprising:

a substantially rigid and hollow vacuum bell having a lower open end;

said vacuum bell having a core portion extending downwardly within said vacuum bell toward the open end of said bell, said core portion and said bell constituting a single piece member;

first means for creating a partial vacuum in said vacuum bell;

said core portion having an upper end protruding from said bell for selective interconnection with said first means;

an air communication passage extending between said vacuum bell and said first means through said core portion, said passage extending from said upper protruding end of said core portion to a side surface of said core portion disposed within said bell and being in operative communication with said first means;

said passage being formed within said single piece member;

a contact member including an elongated holder member having an opening defined in the lower end thereof, said holder member being fabricated of substantially electrically-conductive material;

an electrically-conductive sponge member disposed at least partially within said opening of said holder member;

said core portion having an opening defined in the lower end thereof selectively slidably receiving and holding said holder member in a manner such that said sponge member is disposed proximal to a lower open end of said vacuum bell with said holder member being held in said core portion opening;

second means for selectively operably connecting said core portion to an external medical instrument such that said sponge member is electrically connected to said external medical instrument via said holder member and said core portion of said bell;

said core portion being electrically conductive;

a substantially hollow resilient ring member secured to and being co-extensive with the periphery of said lower open end of said vacuum bell; and

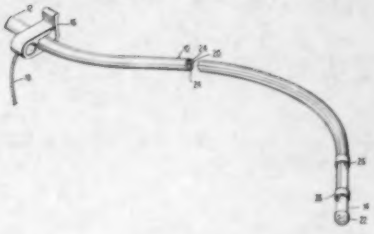
said ring member, when disposed in contact with an area of human skin, being substantially collapsible upon evacuation of said vacuum bell so as to bring said sponge member into contact with an area of skin.

4,369,794

## PROBE WITH ELECTROCARDIOGRAPHIC MONITORING

Alan G. Furler, Glens Falls, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 30, 1980, Ser. No. 202,119
Int. Cl.³ A61B 5/02
U.S. Cl. 128—671 10 Claims



1. A disposable probe for monitoring internal conditions of a patient and a reusable connector for use with said probe, comprising:

(a) a tubular member having a central lumen and having a proximal portion and a distal portion, said distal portion being adapted to be inserted internally of the patient, and including means for electrically monitoring an internal condition of the patient;

(b) said tubular member including a plurality of circumferentially spaced conductive pathways in the wall thereof extending between said proximal portion and said monitoring means for conducting electrical signals;

(c) a connector mountable on said proximal portion in a position extending transversely of said tubular member;

(d) said connector including a plurality of spaced members each electrically engaging a corresponding one of said conductive pathways and including conductors connected to said members and extending externally of said connector for attachment to suitable monitoring apparatus for conveying said signals to the apparatus;

(e) said connector including relatively movable first and second sections positively holding said connector in clamping engagement with said tubular member and holding said engaging members in electrical contact with said conductive pathways;

(f) said connector including means for limiting clamping movement of said sections to prevent constriction of said lumen by said connector.

---

4,369,795

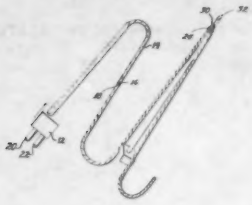
## IMPLANTABLE MICROTHERMOCOUPLE MEMBER

James I. Bicher, 2623 Worchester, West Bloomfield, Mich. 48033, and Stanley Frinak, 13711 Victoria, Oak Park, Mich. 48237

Filed Jun. 17, 1980, Ser. No. 160,218
Int. Cl.³ A61B 10/00
U.S. Cl. 128—736 10 Claims

1. A microthermocouple member which comprises two wires of dissimilar metals joined together into a thermocouple junction, said wires having diameters of no more than 75 microns; an elongated, thin support thread member; said wires and junction being carried by said elongated, thin support thread member, said member being thin enough to be capable of insertion into living tissue without serious disruption of the local circulation, or causing overheating of the tissue in a microwave field, said support thread member extending beyond said junction and wires to permit grasping of said extending support thread member in a forward-slanted slot of a front-

pointed stylet, and means permitting one end of the wires to be connected to recording instrumentation means, said thermo-



couple junction being carried at an intermediate position on said support thread member.

---

**4,369,796**

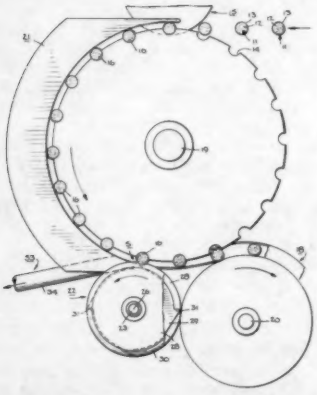
## METHOD AND APPARATUS FOR FORMING AN AIR DILUTION FILTER

**Floyd V. Hall, Durham, N.C., assignor to Liggett Group Inc., Montvale, N.J.**

**Continuation-in-part of Ser. No. 826,136, Aug. 19, 1977, Pat. No. 4,232,574. This application Mar. 14, 1980, Ser. No. 130,570**

**Int. Cl.³ A24C** *5/00, 5/56, 5/60*

**U.S. Cl. 131—95** **4 Claims**



**1.** In an apparatus for providing an aeration zone in a filter plug having a layer of impervious plug wrap paper circumferentially about a body of entrainment-type fibrous filter material, the combination comprising

a rotatable filter plug alignment drum having a plurality of peripherally disposed grooves for sequentially receiving and aligning a plurality of filter plugs,

a storage drum for sequentially receiving the filter plugs from said alignment drum, and

means adjacent said drums for stripping a peripheral section of plug wrap paper to form at least one peripheral air pervious zone in each filter plug for permitting air to flow through said plug wrap paper directly into said filter body.

**4,369,797**

## FEED MECHANISM FOR TOBACCO CUTTING MACHINES

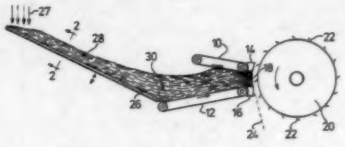
**Warren A. Brackmann, Cooksville, and Stanislav M. Snaidr, Mississauga, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Don Mills, Canada**

**Filed Dec. 10, 1980, Ser. No. 215,006**

**Claims priority, application United Kingdom, Dec. 12, 1979, 7942887**

**Int. Cl.³ A24B** *7/04, 7/14*

**U.S. Cl. 131—109 AB** **11 Claims**



**1.** A method of supplying tobacco in threshed tobacco lamina or whole leaf form to a cutting station wherein the tobacco is forwarded horizontally and is comminuted at the rate at which it enters the station, which comprises:

forming a relatively thin layer of tobacco on a conveying surface in which the tobacco is oriented substantially planarly of the layer and is substantially evenly distributed across the width thereof,

subjecting said thin layer to vibration whereby the tobacco in said layer densifies without the use of any force other than gravity,

conveying said thin layer towards said cutting station,

inlerleaving said tobacco in said thin layer with longitudinally-adjacent tobacco without altering the orientation of the leaves in the said thin layer to form a relatively thick layer of interwoven compacted tobacco in which the tobacco is oriented planarly of the relatively-thick layer and containing the quantity of tobacco desired to be fed to said cutting station,

and

feeding said relatively thick layer to said cutting station without substantially altering the orientation of the tobacco in said layer.

---

**4,369,798**

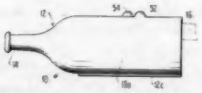
## COMBINATION CIGARETTE HOLDER AND CIGARETTE SMOKE CATCHER

**Allen C. Jackson, 230 Wroxeter Rd., Rugby Hall, Arnold, Md. 21012**

**Filed Aug. 4, 1981, Ser. No. 289,856**

**Int. Cl.³ A24D** *3/00, 3/04*

**U.S. Cl. 131—330** **5 Claims**



**1.** An improved cigarette holder for holding a cigarette or the like during smoking, said holder comprising:

a holder body, a hollow mouthpiece for said body, a pair of airflow passages within said body in communication respectively at one end, to said hollow mouthpiece, said passages opening at their other ends to the exterior of said body remote from said mouthpiece, one of said passages adapted to closely hold the unlighted end of a cigarette

whose lighted end projects outwardly of said body and the other of said passages bearing a smoke catcher filter and wherein said body includes first valve means for selectively allowing air flow through the cigarette in said one passage to the smoker via the mouthpiece during inhaling and second valve means in said second passage for selectively allowing flow outwardly of the body through said second passage bearing said smoke catcher filter during exhaling.

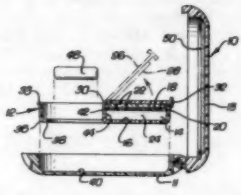
---

**4,369,799**

## COSMETIC POWDER DISPENSING DEVICE

**Jo Napoleon, 432 S. Curson Ave., #1-D, Los Angeles, Calif. 90036**

**Filed May 11, 1981, Ser. No. 262,308**
**Int. Cl.[2] A45D *33/00***
**U.S. Cl. 132—83 R** **21 Claims**



1. An iron oxide based makeup powder dispensing device comprising:

chamber means for confining a fine pigmented powder in a generally thin areally volumetric region;

cover means for preventing escape of the makeup powder from the chamber means, the cover means adjacent said chamber means in facing relationship thereto, and for sparingly allowing passage of the powder therethrough; and

plate means for providing a makeup adhering surface and comprising a substantially nonporous makeup adhering surface, the plate means movable from a first position whereby the adhering surface is in facing relationship to the cover means for sparingly receiving the pigmented powder, the plate means movable remote from the first position to allow the makeup to be removed from the adhering surface and applied to a wearer.

---

**4,369,800**

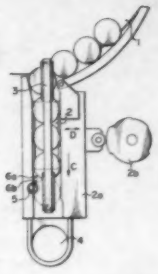
## COIN HANDLING APPARATUS HAVING A SIGNAL OPERATED BLOCKER

**Kenkichi Watanabe; Katusuke Furuya, and Toyoki Kimoto, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan**

**Filed Apr. 10, 1981, Ser. No. 252,783**
**Claims priority, application Japan, Apr. 15, 1980, 55-49442**
**Int. Cl.[3] G07D *9/04***
**U.S. Cl. 133—8 R** **8 Claims**

1. A coin handling apparatus including: selecting means for selecting a predetermined kind of coins from the remaining coins; a guide passage disposed adjacent to said selecting means for guiding the selected coins therethrough; conveyor means for conveying said selected coins on said guide passage; and handling means disposed downstream of said guide passage for handling the coins having been conveyed thereto,

wherein the improvement comprises: blocking means disposed in said guide passage for normally opening said guide passage and for closing the same thereby to block the succeeding coins; passage control means for controlling the opening and closing operations of said blocking means; detecting means for detecting the coin, which is to pass therethrough in said guide passage, thereby to generate outputs; stop signal generating means for generating a stop signal to stop said coin; coin stop control means for generating a controlled stop signal in accordance with both the outputs of said detecting means and the stop signal of said stop signal generating means; and drive means for driving said passage control means in accordance with the controlled stop signal of said coin stop control means thereby to effect the closing operation of said blocking means, whereby said coin is prevented from jamming between said conveyor means and said blocking means when said blocking means is driven to stop supply of any more coins to said handling means.



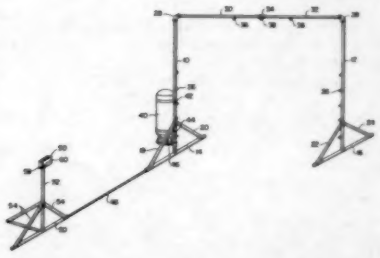
---

**4,369,801**

## APPARATUS FOR WASHING AN ARTICLE

**Jack D. Jones, Lima, Ohio, and Russell K. Glover, Tequesta, Fla., assignors to Aircraft Dynamics Corporation, Elida, Ohio**

**Filed May 18, 1981, Ser. No. 264,863**
**Int. Cl.[3] B60S *3/04***
**U.S. Cl. 134—58 R** **7 Claims**



1. Apparatus for washing an article comprising:

a framework through which the article can pass;

a plurality of spray nozzles mounted on said framework and directed so as to spray liquid on to the article passing therethrough;

a tank for holding liquid;

a conduit for supplying liquid from said tank to said nozzles;

valve means for controlling the flow of fluid along said conduit from said tank to said nozzles;

a timer for opening said valve means at the beginning of a predetermined interval, thereby allowing said liquid to pass from said tank to said nozzles, and for closing said valve means at the end of said predetermined interval;

means for acutating said timer, thereby beginning said interval; and

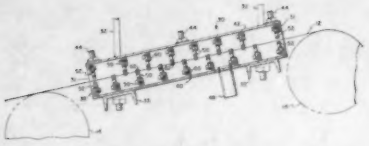
means for pressurizing said liquid in said tank and thereby ensuring that at least a predetermined amount of liquid flows from said tank to said nozzles during said interval.

**4,369,802**

## WIRE GALVANIZER COOLER

**Clifford K. F. Chou, Antioch, and Paul McCarthy, Concord, both of Calif., assignors to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Jul. 8, 1981, Ser. No. 281,443**
**Int. Cl.³ B05C *3/04***
**U.S. Cl. 134—122 R** **1 Claim**



1. Apparatus for cooling continuous lengths of parallel, laterally spaced wires moving along substantially coplanar pass lines comprising:

(a) a substantially enclosed chamber defined by rectangularly disposed bottom and side walls and a removable top wall;

(b) a plurality of longitudinally spaced, resilient plates formed of rubber-like material extending alternately from said chamber top and bottom walls and disposed transversely of said side walls in overlapping relation to said wire pass lines;

(c) recesses in the edges of said plates for guiding said wires along said pass lines;

(d) the opposite ends of said chamber being defined by substantially vertically opposed baffle plates providing spaces at the interfaces thereof for the discharge of cooling liquid from said chamber; and

(e) cooling liquid supply means communicating with said chamber intermediate the ends thereof for supplying cooling liquid under pressure to, and substantially filling said chamber for immersing said wires.

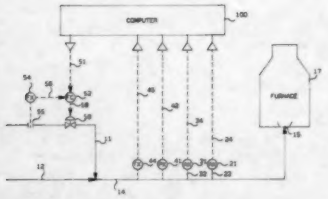
---

**4,369,803**

## CONTROL OF FUEL GAS BLENDING

**Danny L. Furr, Broken Arrow, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jan. 28, 1981, Ser. No. 229,037**
**Int. Cl.³ E03B *1/00*; F17D *1/00***
**U.S. Cl. 137—6** **6 Claims**




4. A method for controlling the mixing of a first fuel gas stream with a second fuel gas stream to form a mixed fuel gas stream, wherein said first fuel gas stream has a higher BTU content than said second fuel gas stream, said method comprising the steps of:

establishing a first signal representative of the actual BTU content of said mixed fuel gas stream;

establishing a second signal representative of the desired BTU content of said mixed fuel gas stream;

comparing said first signal and said second signal and establishing a third signal responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the flow rate of said first fuel gas stream required to maintain the actual BTU content of said mixed fuel gas stream substantially equal to the desired BTU content for said mixed fuel gas stream;

establishing a fourth signal representative of the actual dew point temperature for said mixed fuel gas stream;

establishing a fifth signal representative of the actual temperature of said mixed fuel gas stream;

establishing a sixth signal representative of a desired difference between said fourth signal and said fifth signal;

subtracting said sixth signal from said fifth signal to establish a seventh signal;

comparing said fourth signal and said seventh signal and establishing an eighth signal responsive to the difference between said fourth signal and said seventh signal, wherein said eighth signal is scaled so as to be representative of the flow rate of said first fuel gas stream required to maintain the desired difference between said fourth signal and said fifth signal;

establishing a ninth signal representative of the lower of said third and eighth signals; and

manipulating the flow rate of said first fuel gas stream in response to said ninth signal.

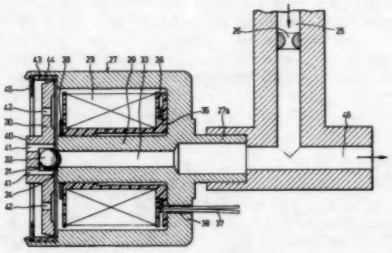
---

**4,369,804**

## ELECTROHYDRAULIC TRANSLATION APPARATUS, IN PARTICULAR PERMITTING CONTROL OF A PRESSURE IN AN AUTOMATIC TRANSMISSION

**Jean M. Bouvet, Boulogne-Billancourt, and Philippe Quemerais, Thurins, both of France, assignors to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France**

**PCT No. PCT/FR80/00006, § 371 Date Sep. 18, 1980, § 102(e) Date Sep. 15, 1980, PCT Pub. No. W080/01502, PCT Pub. Date Jul. 24, 1980**
**PCT Filed Jan. 17, 1980, Ser. No. 209,230**
**Claims priority, application France, Jan. 18, 1979, 79 01267**
**Int. Cl.³ G05D *16/00***
**U.S. Cl. 137—85** **22 Claims**



15. An electrohydraulic transducer, comprising,

a body of magnetic material having a core provided with a fluid passage extending therethrough to an outlet opening which is located at one end of the core,

an electromagnetic coil means mounted on said core,

a substantially flat movable magnetic element mounted at said one end of the core,

a nonmagnetic closure member mounted between said movable magnetic element and said outlet opening,

means for energizing said electomagnetic coil means with a unidirectional pulsed electric current which is operable to vibrate said movable magnetic element,

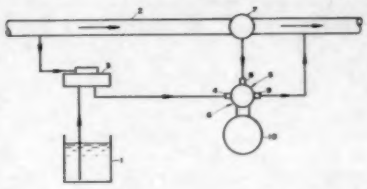
said movable magnetic element, when vibrated, biasing the closure member to counteract the hydraulic force of fluid from the fluid passage, and controlling the pressure within said fluid passage by controlling the rate of fluid flow through the outlet opening.

4,369,805

## LIQUID METERING INJECTOR ASSEMBLY

Chanany Tavor, Kibbutz Amiad, Israel, assignor to Amiad Mutzarei Yiul, Korazim, Israel

Continuation of Ser. No. 67,232, Aug. 16, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 225,033
Claims priority, application Israel, Nov. 15, 1978, 55953
Int. Cl.³ G05D 11/00
U.S. Cl. 137—101.31 11 Claims



8. A liquid metering injector assembly for injecting selectively variable metered quantities of a fertilizing liquid into metered quantities of water comprising:

a metering cylinder,

a metering piston displaceable in said metering cylinder,

first and second metering ports each formed on opposite sides of said metering cylinder,

means for varying the stroke length of said metering piston to thereby vary the metered amounts displaced by said metering piston,

a hydraulically operated valve unit having a valve inlet,

means for coupling said valve inlet means to a pressurized source of said fertilizer liquid,

a hydraulic pressure pulse source operated to provide hydraulic pressure pulses as a function of the passage of a fixed amount of water to thereby meter fixed amounts of flowing water, said hydraulic pressure pulses acting upon said valve to actuate said valve unit,

a valve outlet on said valve unit for coupling said valve to a pipe carrying said flowing water,

first and second valve communication ports on said valve unit respectively communicating with said first and second metering ports,

said valve unit comprising a displaceable spool valve,

said spool valve being displaced by said hydraulic pressure pulses between a first position wherein said inlet is in communication with said first metering port and said outlet is in communication with said second metering port and a second position wherein the inlet is in communication with the second metering port and the outlet is in communication with the first metering port,

means for displacing said spool valve between said first and second positions responsive to the receipt of said hydraulic pressure pulses, and

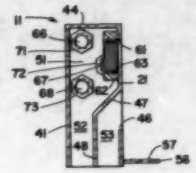
means for maintaining said spool valve in the last displaced position until the receipt of a further one of said hydraulic pressure pulses whereby said valve has two stable outlet positions, one connecting the inlet to the first communication port and the outlet to the second communication port and a second stable position wherein said inlet is connected to the second communication port and the outlet is connected to the first communication port for successively filling the cylinder on one side of said piston with fertilizer while forcing the fertilizer on the other side of said piston into said pipe carrying the water, responsive to the pressure pulses.

4,369,806

## VACUUM BREAKER AND MIXING CHAMBER

Tore H. Noren, 3200 Lakeville Hwy., Petaluma, Calif. 94952

Filed Mar. 17, 1981, Ser. No. 244,603
Int. Cl.³ F16K 24/00
U.S. Cl. 137—216 4 Claims



1. A combined mixing chamber and a vacuum breaker comprising

a housing having an open bottom with a water inlet in a front face thereof and at least one opening for insertion of a chemical in a wall thereof,

an inclined floor in said housing extending inwardly and downwardly from the front face of said housing beneath said openings to a substantially vertical wall dividing said housing laterally thereacross above the open bottom, and

said front face of said housing having an aperture therethrough beneath said floor to define an air passage between front and bottom of said housing.

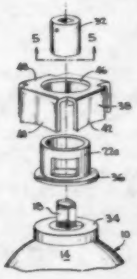
---

4,369,807

## PROTECTIVE FIRE HYDRANT GUARD

John P. Camp, 8717 Hopewell Dr., El Paso, Tex. 79925

Filed Aug. 1, 1980, Ser. No. 174,401
Int. Cl.³ F16K 35/06; E03B 9/06, 9/14
U.S. Cl. 137—296 2 Claims

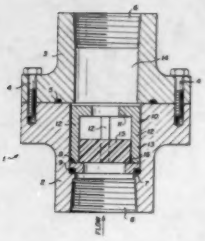


1. In combination with a fire hydrant having a stand pipe on which a bonnet is mounted and having a valve operating stem extending rotatably through the bonnet and terminating in a nut end above the bonnet, a protective arrangement for the nut end comprising a collar arrangement fixedly welded on the bonnet and surrounding the nut end and extending well above the nut end so that an ordinary wrench cannot engage the nut end with said collar arrangement having openings so that debris cannot collect around the nut end and a weather guard surrounding the nut end above the bonnet and said collar arrangement includes a flanged adapter welded to the bonnet around the weather guard, said collar being disposed within the adapter and extending upwardly therefrom and having an annular flange cooperating with the flange on the adapter whereby axial withdrawal of the collar is prevented while permitting free rotation of the collar without activating the hydrant.

## 4,369,808
## DISC-TYPE CHECK VALVE

Emanuel F. Hagman, Box 594, Drayton Valley, Alberta, Canada

Filed Jan. 22, 1981, Ser. No. 227,365
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—515.5 1 Claim

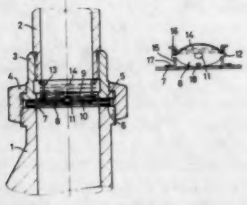


1. A check valve comprising:
a valve body having separate inlet and outlet segments forming a longitudinal bore extending therethrough, said segments being bolted together and having O-ring seal means sealing their contacting surfaces;
a discrete removable annular seat member positioned in the bore and supported by the inlet segment and providing a flat annular upper surface for functioning as a valve seat;
O-ring seal means, positioned between the seat member and inlet segment, for preventing leakage between them;
a resilient plastic disc adapted to seat on the seat member to stop flow through the bore; and
removable guide means, positioned in the bore on the seat member and containing the disc, for guiding the disc when it moves off the valve seat and enabling flow to move past said disc when it is unseated, said guide means consisting of an end wall and depending spaced legs which stand on the seat member, said end wall forming at least one central aperture and peripheral flow passages, whereby liquid may flow between the legs and through said aperture and flow passages when the disc is unseated.

## 4,369,809
## BACK-PRESSURE VALVE FOR HEATING INSTALLATIONS

Karl Euerle, Bruckstrasse 73, D-7463 Rosenfeld 5, Fed. Rep. of Germany

Division of Ser. No. 36,904, May 7, 1979, Pat. No. 4,273,155.
This application Mar. 11, 1981, Ser. No. 242,768
Claims priority, application Fed. Rep. of Germany, May 9, 1978, 7813921[U]
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—543.19 4 Claims

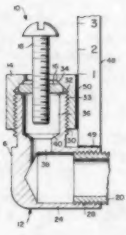


1. An improved back-pressure valve assembly for insertion in connectable joints of pipe lines, comprising an annular support element having a central aperture, and a seat area surrounding said central aperture, diametrically opposed pairs of guide members affixed to said annular support element and including outer support ends, a pair of juxtaposed upper and lower disc members arranged to cooperate with said central aperture, to close and open said central aperture at least one of said disc members arranged to register in said seat area to close said central aperture and wherein at least one of said disc members includes oppositely extending ears positioned relative to said guide members to glide between said pairs of guide members, a spring means which encircles said guide members between said outer support ends on said pairs of guide members and said ears on said at least one disc member, said spring means applying a force on said ears on said at least one disc member to force said at least one disc member in a normally closed position.

## 4,369,810
## RADIATOR VENT VALVE

Lewis A. Eckenrode, 284 Philadelphia Ave., Chambersburg, Pa. 17201

Filed Oct. 10, 1980, Ser. No. 196,126
Int. Cl.³ F16K *37/00*
U.S. Cl. 137—556 5 Claims



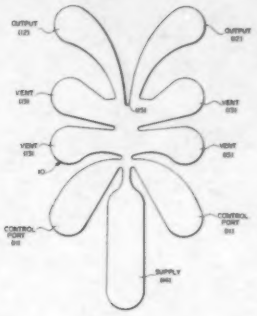
1. A vent valve for use with a radiator comprising:
a conduit adapted to be placed in fluid communication with a radiator, said conduit having a first portion, a second portion extending transversely therefrom and a hollow interior extending through said portions of said conduit;
said hollow interior of said second portion of said conduit having a wide section of a first diameter, a narrow section of a second diameter less than said first diameter, and a tapered section disposed between said wide and narrow sections and having a diameter tapering between said first and second diameters, said narrow section being disposed below said wide section;
said second portion having a threaded exterior and an upper edge;
a cap having a threaded interior surface mating with the threaded exterior of said second portion and an upper interior surface with a hole formed therethrough, said cap being threaded down into said second portion;
a nut supported on said upper edge within and beneath said cap and secured thereto by contact with said upper interior surface of said cap;
a bolt having a head facing outward and a body extending inward through said hole, threaded into said nut and extending into the hollow interior of said second portion of said conduit said bolt having a length sufficient for its body to reach into said narrow section when said bolt is screwed downwardly through said nut; and
at least one opening formed through said nut to provide a vent passage from said hollow interior of said conduit.

**4,369,811**

## NULL BALANCING FOR FLUIDIC SENSORS AND AMPLIFIERS

**Francis M. Manion, Rockville, and Charles E. Paras, Suitland, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 20, 1978, Ser. No. 953,292**
**Int. Cl.³ F15C *1/14***
**U.S. Cl. 137—819** **5 Claims**



1. A fluidic transducer comprising:
an input end and an output end disposed on an axis extending through said transducer;
at least two output signal channels at said output end symetrically disposed on opposite sides of said axis;
a first input signal control channel means disposed on one side of said axis;
a second input signal control channel means disposed on an opposite side of said axis;
source means for directing a jet stream of fluid substantially along said axis from said input end of said transducer to said output end thereof, said jet stream being offset by a predetermined distance from said axis at said output end when no input signals are applied to said control channels;
first regulating means for supplying fluid at a selected flow rate to said control channel means to substantially reduce the amount of offset of said jet stream from said axis; and
second regulating means for individually supplying fluid at selected flow rates to each one of said input signal control channel means to substantially remove the amount of offset not removed by said first means.

---

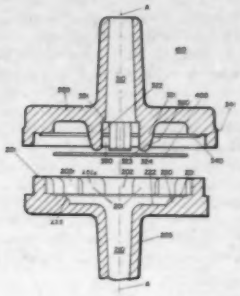
**4,369,812**

## CONTROL OF FLUID FLOW USING PRECISELY POSITIONED DISC

**Joseph R. Paradis, Holden, and Edward W. Kaleskas, Jefferson, both of Mass., assignors to Nypro Inc., Clinton, Mass.**

**Filed Feb. 18, 1981, Ser. No. 235,668**
**Int. Cl.³ F16K *15/14***
**U.S. Cl. 137—843** **12 Claims**

1. A flow control device comprising
a housing;
a flow channel in said housing extending to a control channel which is coaxial therewith;
a valve seat in said control channel surrounding a further flow channel extending from said control channel; and
a flexible disc positioned on said valve seat of said control channel,
said control channel having an inside wall surface extending from said valve seat and interrupted by a plurality of peripheral relief channels; and
means for prebiasing said flexible disc comprising a set of prongs for engaging the central portion of said disc within the opening of said valve seat and being separated by passageways which extend to said flow channel;
the diameter of the interrupted inside wall surface being less than the diameter of said disc;



thereby to assure precise positioning of said disc on said valve seat.

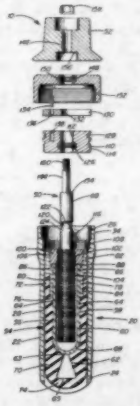
---

**4,369,813**

## PIPE STOPPER METHOD AND APPARATUS

**John H. Thomas, Pittsburgh, Pa., assignor to Kerotest Manufacturing Corp., Pittsburgh, Pa.**

**Filed Jan. 26, 1981, Ser. No. 228,579**
**Int. Cl.³ F16L *55/10, 55/12***
**U.S. Cl. 138—94** **20 Claims**



1. Pipe stopper apparatus comprising,
a fitting having a tubular body portion adapted to be secured to a pipeline in surrounding relation with a cut-out portion of the pipeline, said tubular body portion having a longitudinal passageway and a lower open end portion,
a plug assembly positioned in said passageway,
said plug assembly including an expandable portion and an insert portion,
said expandable portion including a body portion surrounding a chamber formed in said expandable portion,
said chamber including an enlarged portion and a reduced portion with a constricted opening connecting said enlarged portion and said reduced portion,
said insert portion being normally retained in said chamber enlarged portion for movement through said constricted opening, said constricted opening being shaped to provide resistance to movement of said insert portion therethrough so that said body portion expands upon move-

ment of said insert portion from said chamber enlarged portion into said constricted opening and said chamber reduced portion,

a plug assembly guide positioned in said passageway between said expandable portion and said insert portion for longitudinal movement in said passageway,

guide means for guiding said plug assembly guide for longitudinal, nonrotational movement in said passageway,

a stem positioned for rotation in said passageway,

said plug assembly guide being connected to said stem for longitudinal movement relative to said stem,

operator means for rotating said stem to nonrotatably, longitudinally move said plug assembly guide in said passageway relative to said expandable portion,

said plug assembly guide being movable in said passageway to a first position to advance said plug assembly through said lower open end portion and the cut-out portion to a position in the pipeline for expansion of said expandable portion,

and

said plug assembly guide being operable upon continued rotation of said operator means to move from said first position to a second position in said passageway to force said insert portion into said constricted opening and said chamber reduced portion and exert an outward force upon said expandable portion body portion to expand said body portion into sealing arrangement with the interior of the pipeline to block flow in the pipeline.

---

**4,369,814**

## FLEXIBLE TUBULAR JOINT

**Kenneth M. Humphrey, Fleet, England, assignor to Underwater and Marine Equipment Limited, Farnborough, England**

**Filed Jan. 28, 1981, Ser. No. 229,071**

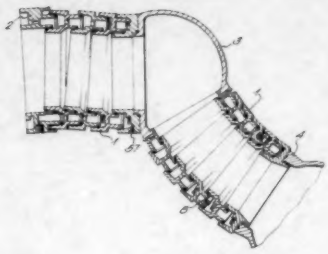
**Claims priority, application United Kingdom, Nov. 27, 1980, 8038023**

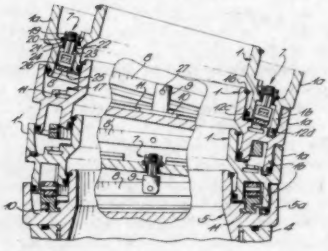
**Int. Cl.³ F16L *11/18***

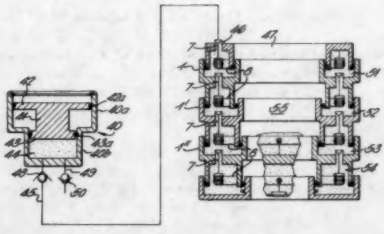
**U.S. Cl. 138—120** **28 Claims**

**1.** In a joint of the type comprising a plurality of annular connecting members, one of said members having an annular piston portion, an adjacent one of said members having an annular cylinder portion, said annular piston portion being coupled to said annular cylinder portion whereby adjacent one of said connecting members are connected in series, said annular piston portion and said annular cylinder portion of said adjacent connecting members defining a chamber, substantially incompressible fluid in said chamber, and at least one valve in each of said connecting members forming means for providing communication of said fluid between adjacent chambers; the improvement wherein a gimbal mounting is provided for each valve in a respective one of said connecting members, said gimbal mounting being slidably anchored in an adjacent one of said connecting members.

**27.** A flexible tubular joint comprising annular end members, a plurality of annular connecting members, said annular connecting members being connected in series with one another and said series connection being connected to said annular end members, each of said connecting members having an annular piston portion and an annular cylinder portion, said annular piston portion of a preceding one of said annular connecting members being coupled to said annular cylinder portion of an adjacent one of said annular connecting members whereby said annular connecting members are connected in series, each of said cylinder portions having first inner and outer annular walls, inside surfaces of said first inner and outer annular walls being spherically curved, said first inner and outer annular walls also terminating in respective circular rims, each of said piston portions having corresponding second inner and outer annular walls, said second inner and outer annular walls terminating in respective circular rims, said second inner and outer annular walls also being provided with means for making slidable and sealing contact with said inside surfaces of said first inner and outer annular walls of said cylinder portion, said circular rims of said first inner and outer annular walls of said cylinder portion being axially stepped or staggered with respect to one another, said circular rims of said second inner and outer annular walls of said piston portion also being axially stepped or staggered with respect to one another, said axial stepping or staggering of said circular rims of said first inner and outer annular walls being opposite to said axial stepping or staggering of said circular rims of said second inner and outer annular walls whereby assembly of said connecting members in series is facilitated with regard to the spherical curvature of said inside surfaces of said first inner and outer walls of said cylinder portion and with regard to the required tolerances of said sliding and sealing contact.







**4,369,815**

## DEVICE FOR COUPLING A HEDDLE FRAME TO VERTICALLY RECIPROCATING DRIVE BARS

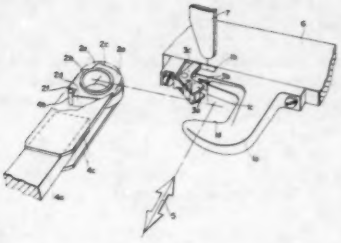
**Fritz Gehring, Lindau-Bodolz; Florian Windischbauer, Haslach, and Horst Häussler, Lindau, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany**

**Filed Aug. 18, 1980, Ser. No. 179,165**

**Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933699**

**Int. Cl.³ D03C** *13/00, 9/06*

**U.S. Cl. 139—57** **3 Claims**



1. In a suspension device for the heddle frame motion at heddle frames with a first coupling part designed as a hook with a mouth tapering in a wedge-like manner, and with a second rotatably supported coupling part designed as a mating piece with corresponding wedge-surfaces and spanned by the mouth of the hook,

the improvement comprising a pivotal, spring-loaded locking pawl adapted to be overridden by a wedge-like surface of the rotatable mating piece mounting to the hook-shaped coupling part, and a curved recess provided as a latching means for the locking pawl at the widened end of the wedge-like surface of the mating piece, different positions being assumed in the locked position by the center of rotation of the locking pawl and the center of curvature of the recess, whereby when pivoting the locking pawl, bracing takes place between the locking pawl and the mating piece.

---

**4,369,816**

## FANCY, HIGH-STRENGTH FABRIC

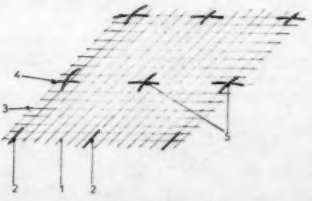
**Pierre Payen, 53, rue Chaziere, 69004 Lyon, France**

**Filed Sep. 30, 1981, Ser. No. 307,097**

**Claims priority, application France, Oct. 2, 1980, 80 21384**

**Int. Cl.³ D03D** *15/00*

**U.S. Cl. 139—426 R** **6 Claims**



1. In a fancy woven fabric, applicable in particular as a coating substrate, of the kind comprising in warp and in weft an alternation of threads of different nature, effects being obtained at the crossing point of at least one warp thread with at least one filling thread, the improvement consisting in that:

(a) wrap type warp and filling threads form the effects, said wrap threads being of the same nature and each comprising a core and a covering thread and having a stable circular cross section, and said effect forming threads are kept apart from one another by warp threads and filling threads of a different nature from the effect forming threads, which threads of a different nature form the fabric ground; and

(b) the effects are obtained by floats in warp and filling on the front face of the fabric and are raised.

---

**4,369,817**

## WEFT PICKING DEVICE OF AIR JET TYPE WEAVING LOOM

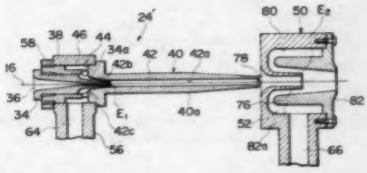
**Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Company Limited, Japan**

**Filed Dec. 27, 1978, Ser. No. 973,586**

**Claims priority, application Japan, Jan. 6, 1978, 53-263**

**Int. Cl.³ D03D** *47/30*

**U.S. Cl. 139—435** **9 Claims**



1. A weft picking device for an air jet type weaving loom, comprising a weft inserting nozzle for inserting a weft yarn through the shed of warp yarns,

said weft inserting nozzle including,

a weft introduction pipe member disposed in said nozzle and having an opening through which the weft yarn is introduced into said nozzle, the opening of said pipe member being coaxial with said nozzle;

means defining a first air passage through which high pressure air is ejected along the axis of said nozzle to pull the weft yarn toward the shed of the warp yarns, the first air passage defining means including a first pipe member whose axis is aligned with the axis of said weft introduction pipe member, said first pipe member having an elongate opening which communicates with a high pressure air source to eject the high pressure air therethrough, the tip portion of said introduction pipe member being located in the elongate opening of said first pipe member;

means defining a second air passage through which low pressure air is ejected along the axis of said nozzle to carry the weft yarn through the shed of the warp yarns in cooperation with the high pressure air, the low pressure air being lower in pressure than the high pressure air, at least a part of said second air passage being disposed circumferentially around a length of said first air passage; and

means for setting the low pressure air ejected through said second air passage larger in amount than the high pressure air ejected through said first air passage.

---

**4,369,818**

## WEFT YARN FEEDER

**Tadahiro Yoshida, Fujisawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan**

**Filed Oct. 15, 1980, Ser. No. 197,227**

**Claims priority, application Japan, Oct. 16, 1979, 54-143113[U]**

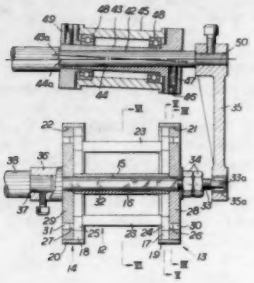
**Int. Cl.³ D03D** *47/36*

**U.S. Cl. 139—452** **3 Claims**

1. A yarn feeder comprising:

(a) a support;

(b) a fixed shaft supported at only one end thereof by said support;
(c) a sleeve angularly adjustably mounted in a selected fixed position on said fixed shaft, said sleeve having a longitudinal bore through which said fixed shaft extends, the axis of said longitudinal bore being inclined to the axis of said sleeve;



(d) a roller rotatably mounted on said sleeve concentrically thereof;
(e) a rotatable shaft disposed parallel to said fixed shaft;
(f) a spool mounted on said rotatable shaft for rotation therewith; and
(g) a bracket connecting said fixed shaft and said rotatable shaft at their free ends.

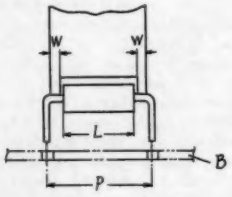
---

**4,369,819**

## LEAD WIRE FORMING APPARATUS FOR ELECTRIC PARTS

**Hiromi Kinoshita; Yoshinobu Maeda, both of Katano, and Tadashi Tanno, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**PCT No. PCT/JP79/00314, § 371 Date Aug. 18, 1980, § 102(e) Date Aug. 18, 1980, PCT Pub. No. WO80/01330, PCT Pub. Date Jun. 26, 1980**
**PCT Filed Dec. 12, 1979, Ser. No. 202,443**
**Claims priority, application Japan, Dec. 20, 1978, 53-159758**
**Int. Cl.³ B21F *1/00***
**U.S. Cl. 140—105** **1 Claim**



1. A lead wire forming apparatus for electric parts having a body member and coaxial lead wires extending from opposite ends of the body member, the apparatus being for bending each lead wire in the same direction perpendicularly to the axis of the body member, said apparatus comprising:
a pair of spaced opposed holding members for holding said body member by relative movement toward the body member in directions perpendicular to the lead wires, and a pair of spaced parallel forming guides each having a guiding groove in the edge thereof opposed to the other forming guide and having a size for receiving a corresponding lead wire therein, said forming guides being spaced from each other a distance only slightly larger than the length of the body member of the electric part, said forming guides and holding members being relatively movable in the direction of the parallel forming guides for causing the lead wires to be engaged in the guiding grooves for bending the lead wires on both ends of the body member in the same direction at points immediately adjacent the ends of the body member, one of said holding members being movable between a first position in which it is engaged by the body member of an electric part to block movement of the body member during bending of the lead wires and a second position transversely of the forming guides in which it is out of engagement with the body member for freeing the body member for movement, a first spring biasing said one holding member toward said first position, said pair of spaced parallel forming guides being movable toward said first position from a location on the opposite side of the body member from said one of said holding members, the space between said forming guides being open on the end moving toward the holding members and the other of said holding members being movable toward said first position from said location on the opposite side of said body member, a piston movable toward said first position from said location on the opposite side of said body member, and a second spring between said piston and said other holding member which is compressed for transmitting the force of said piston to said other holding member, whereby when said one of said holding members is moved to said second position after a bending operation, said spring urges the electric part with the bent lead wires along and out from between said forming guides.

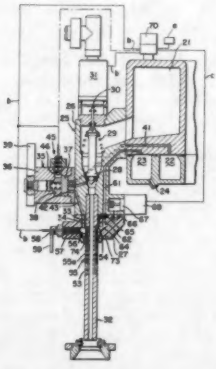
---

**4,369,820**

## FILLING ELEMENT FOR COUNTERPRESSURE FILLING MACHINES

**Egon Ahlers, Neu-Bamberg, and Alfred Rentel, Bad Kreuznach, both of Fed. Rep. of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany**

**Filed Mar. 4, 1981, Ser. No. 240,262**
**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008386**
**Int. Cl.³ B65B *31/00, 3/26***
**U.S. Cl. 141—39** **12 Claims**



1. A filling element, for single- and multi-chamber counterpressure filling machines, for introducing liquid into a container, said filling element comprising:
a filling element body having a container-sealing region at a first end thereof;
a filling tube held in said filling element body for introducing liquid into a container pressed into engagement at said container-sealing region, said filling tube extending

through said container-sealing region into said filling element body, and being surrounded by an annular pressurized gas chamber provided in said filling element body and having an annular gap-like outlet arranged in the region of said container-sealing region, and a cross section which is substantially greater toward the interior thereof than is that of said annular gap-like outlet, said annular pressurized gas chamber being delimited laterally by essentially cylindrical surfaces;

a pressurized gas system, including a pressurized gas valve arrangement controlled by devices installed on said filling machine, and conduits, for introducing and discharging pressurized gas, which open into said pressurized gas chamber, said conduits including at least one pressurized gas outlet conduit opening into the lower end region of said pressurized gas chamber, and at least one pressurized gas inlet conduit which opens into said pressurized gas chamber no lower than the plane of the opening of said at least one pressurized gas outlet conduit, said at least one pressurized gas inlet conduit opening essentially tangentially relative to said cylindrical delimiting surfaces;

a liquid flow valve arranged in said filling element body and operatively associated with said filling tube, said liquid flow valve being controlled at least for closing; and

a control element associated with said filling tube and responding at a predetermined filling level of said liquid in the container for terminating inflow of said liquid thereto.

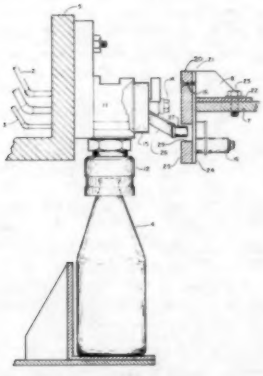
---

**4,369,821**

## CAM ACTUATED FILLER VALVE

**Robert C. Carter, Denver, Colo., assignor to Adolph Coors Company, Golden, Colo.**

**Filed Mar. 30, 1981, Ser. No. 248,726**
**Int. Cl.³ B65B *3/04*; B67C *3/28***
**U.S. Cl. 141—147** **5 Claims**



1. A rotary filling machine comprising:

a rotatable circular frame,

at least one rotary valve having at least one inlet and at least one outlet mounted on the outer periphery of said frame;

valve actuation members mounted on said rotary valve including rotatable means for rotating said valve actuation member comprising:

a cam follower projecting radially outwardly from said rotary valve which when moved a predetermined amount during the rotation of said rotatable circular frame is capable of actuating said valve;

means for supplying and venting fluids, including gases, which communicate with said valve mounted on said frame;

means for conveying containers to be filled into registry with the outlet of at least one of said valves, while said frame is rotating;

means for support adjacent to the perimeter of said circular frame; and

means for camming supported on said support means said camming means including a smooth curved surface defined as:

$$y = H\left(\frac{x}{L} - \frac{1}{2\pi}\frac{\text{Sin } 360^{\circ}\, x}{L}\right)$$

where H is the total change in vertical height of the smooth curve; L is the length of the smooth curve, x is the horizontal distance along the length of the curve from a preselected reference and the resultant y is a vertical distance on the curve from the same reference, whereby, when said cam follower is positioned to engage said stationary camming means during the rotation of said rotatable circular frame at least one function of said valve is actuated in a predetermined sequence depending on the position and location of said camming member.

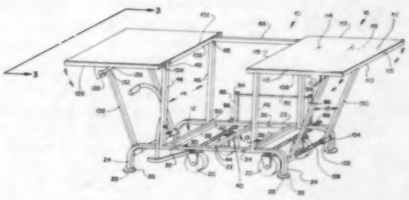
---

**4,369,822**

## COMBINATION TOOL CHEST DOLLY AND LEAVED WORKBENCH

**Robert C. Rice, 6137 Lincoln Hwy., E., Fort Wayne, Ind. 46802**

**Filed Nov. 17, 1980, Ser. No. 207,395**
**Int. Cl.³ B25H *1/00***
**U.S. Cl. 144—286 R** **21 Claims**



1. A combination tool chest dolly and leaved workbench comprising

a frame having generally parallel and spaced apart first and second side members joined by a plurality of cross members, and

a plurality of support legs generally perpendicularly depending from said side members,

a plurality of casters movably mounted to said frame,

said casters being movable between a first position thereof wherein said frame is supported by said legs and a second position thereof wherein said frame is supported by said casters,

a plurality of generally vertically disposed, generally parallel and spaced apart stanchions having upper and lower ends, said stanchions being secured to said frame adjacent to said first and second side members at said lower ends thereof,

at least one work surface leaf swingably mounted between said upper ends of a pair of said stanchions,

said leaf being movable between a first position thereof wherein said leaf lies in a generally vertical plane and to a second position thereof wherein said leaf lies in a generally horizontal plane,

at least one leaf prop having a frame end and a leaf end, said frame end thereof pivotally mounted to said frame, said prop being movable between a first position thereof wherein said leaf end adjoins said pair of stanchions and a

second position thereof wherein said leaf end braces said leaf in said second position thereof.

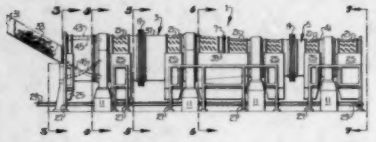
---

**4,369,823**

## BARKING DRUM AND METHOD

**Sten-Ake Gustafsson, Edsvalla, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden**

**Filed Mar. 11, 1981, Ser. No. 242,672**
**Claims priority, application Sweden, Mar. 17, 1980, 8002052**
**Int. Cl.³ B27L *1/00***
**U.S. Cl. 144—340** **10 Claims**



1. A barking drum particularly adapted for the removal of limbs and bark from wood, such as trimmings or trees removed in thinning, said barking drum comprising a rotatable drum which is open at opposite ends, said drum including a pretreatment section, a first plurality of log lifters carried by the interior of the pretreatment section and adapted for engaging the wood received in the pretreatment section, a tapering transition section arranged for receiving the wood from said pretreatment section, a plurality of log lifters of lesser number than in said pretreatment section carried by the interior of said transition section, a final treatment section arranged for receiving the wood from said transition section and a plurality of log lifters greater in number than in said transition section carried by the interior of said final treatment section.

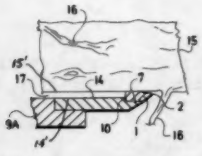
---

**4,369,824**

## CUTTING TOOL FOR TREE DELIMBING DEVICE

**Mirko Dressler, Krtiny; Vojtech Formanek, Jedovnice; Vaclav Michl, Krtiny, and Miroslav Stejskal, Adamov-Josefov, all of Czechoslovakia, assignors to Vyzkumny ustav lesniho hospodarstvi a myslivosti, Jiloviste-Strnady, Czechoslovakia**

**Filed Sep. 22, 1980, Ser. No. 189,342**
**Claims priority, application Czechoslovakia, Sep. 24, 1979, 6430-79**
**Int. Cl.³ B27L *1/00***
**U.S. Cl. 144—343** **5 Claims**



1. A cutting tool for a tree delimbing device, having means for moving the treetrunk to be delimbed in a transport direction comprising in combination,

a frame;

a knife holder operatively mounted on said frame;

a knife bed secured to said knife holder and having a back surface and a shoulder;

a knife mounted in said shoulder of said knife bed and having a back surface, a back cutting edge surface, and a front cutting edge surface, said back and front cutting edge surfaces forming a cutting edge therebetween in said transport direction, said back surface of said knife forming a negative angle with the back cutting edge surface, the back surface of said knife being disposed above the back surface of said knife bed.

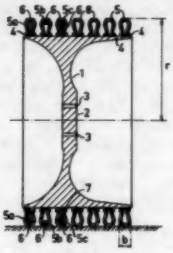
---

**4,369,825**

## MULTIPLE WHEEL TIRE WITH REDUCED NOISE

**Nils-Ake Nilsson, Erikslundsvägen 348, Täby, Sweden (S-183 44)**

**PCT No. PCT/SE79/00150, § 371 Date Mar. 7, 1980, § 102(e) Date Mar. 7, 1980, PCT Pub. No. WO80/00235, PCT Pub. Date Feb. 21, 1980**
**PCT Filed Jul. 10, 1979, Ser. No. 190,765**
**Claims priority, application Sweden, Jul. 10, 1978, 7807693**
**Int. Cl.³ B60E *5/00, 7/00***
**U.S. Cl. 152—157** **6 Claims**



1. A vehicle wheel having low rolling noise comprising:

a rim located about an axis of said wheel;

a plurality of tires mounted on said rim, each of said tires having an inner cavity and being axially separated from each other;

each of said tires having an outer-diameter/sectional-width ratio (2r/b) of greater than 8 wherein 2r is the outer diameter of said tire and b is the cross-sectional width in the axial direction of each individual tire; and,

each of said cavities being filled with a filler material having a hardness of less than 35° Shore A (DIN 53 505).

6. A method of reducing rolling noise on a vehicle including the steps of:

providing said vehicle with wheels each having a plurality of tires mounted on a wheel rim member thereon and each tire having a cavity therein;

structuring each of said tires so that the outer-diameter/sectional-width ratio (2r/b) is greater than 8 wherein 2r is the outer diameter of each said tire and b is the cross-sectional width thereof in the axial direction; and

filling each of said cavities with a filler material having a hardness of less than 35° Shore A (DIN 53 505).

---

**4,369,826**

## MULTI-PIECE WHEEL STRUCTURE

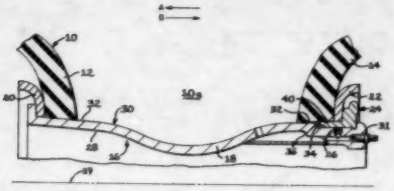
**Vergil P. Hendrickson, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US81/00091, § 371 Date Jan. 23, 1981, § 102(e) Date Jan. 23, 1981, PCT Pub. No. WO82/02518, PCT Pub. Date Aug. 5, 1982**
**PCT Filed Jan. 23, 1981, Ser. No. 275,083**
**Int. Cl.³ B60B *25/08, 25/18***
**U.S. Cl. 152—410** **5 Claims**

1. A wheel structure (16) for a tire (10) comprising:

an annular rim base (18) disposed about a longitudinal axis (19) and having an inner periphery (28) and an outer periphery (30), said outer periphery (30) including a tire mounting surface (32) and a locking surface (34), said locking surface (34) bounding a locking indentation (36) and being disposed radially nearer said longitudinal axis (19) than said mounting surface (32), said rim base (18)

having an annular groove (53) which intersects said locking surface (34);
an annular restraining flange (22) disposed about said rim base (18);
a locking ring (24) which is receivable in said locking indentation (36) and is engageable with said locking surface (34) and said restraining flange (22) to prevent axial movement of said restraining flange (22) in a first direction (B);



means (44,46) for providing fluid communication between the atmosphere and a tire's interior (10a) when a tire (10) is mounted on said tire mounting surface (32);
means (52) for fluidly connecting said groove (53) and said fluid communication means (44,46); and
means (26) for obstructing fluid communication through said groove (53) when said locking ring (24) is in engagement with said locking surface (34).

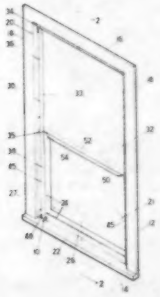
---

**4,369,827**

## WINDOW SHADE SEALING SYSTEM

**Alan A. Anderson, 6701 Seybold Rd., Madison, Wis. 53719**

**Filed Apr. 17, 1981, Ser. No. 255,165**
**Int. Cl.³ E06B 7/16**
**U.S. Cl. 160—41** **23 Claims**



1. A window covering sealing structure adapted to seal a rollable window covering having a flexible covering member with side edges to a window frame which includes inwardly facing opposite side mounting surfaces, comprising:
(a) a pair of strips each having two faces and a longitudinal axis and formed of flexible, resilient sheet material sufficiently flexible that each strip can be folded back on itself into a folded configuration having a longitudinally extending fold portion such that parts of a face are substantially opposed to other parts of the face and the face is concealed from view;
(b) means for holding together opposed portions of the concealed face to retain each strip in the folded configuration with a resilient, longitudinally extending fold portion; and
(c) means for fastening the strips to the opposite side mounting surfaces at points on each strip remote from the fold portion with the fold portion of each strip adjacent to the mounting surface being deformed to partly conform to that surface so that the side edges of the covering will extend between the folded strips and the mounting surface and be held therebetween with a selected amount of force.

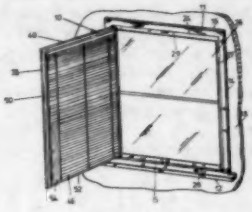
---

**4,369,828**

## SUPPLEMENTAL WINDOW AND BLIND UNIT

**Michael J. Tatro, Wausau, Wis., assignor to Wausau Metals Corporation, Wausau, Wis.**

**Filed May 26, 1981, Ser. No. 266,815**
**Int. Cl.³ A47H 1/00; E06B 3/32**
**U.S. Cl. 160—107** **12 Claims**



1. A supplemental insulating window and blind unit (10) adapted to be installed in a previously installed conventional window unit (13, 15) having a conventional fixed frame (11) with surfaces defining a window opening (24), and an original sash (27) and original window pane (26) closing the window opening (24), the supplemental window and blind unit (10) comprising:
(a) a supplemental peripheral frame (28) for closing the window opening (24) independent from the original sash (27), the supplemental window frame (28) having surfaces defining a framed supplemental window opening (29);
(b) means for fixedly and continuously attaching the supplemental peripheral frame (28) in air-tight sealing relation to surfaces of the conventional fixed frame (11) extending around the periphery of the window opening (24) and interiorly spaced from the original window pane (26);
(c) a sash (36) attached to the supplemental frame (28) in hinged relation and having open and closed positions;
(d) a supplemental window pane (34) mounted in the sash (36) whereby the sash (36) and supplemental window pane (34) close the framed supplemental window opening (29) when the sash (36) is in its closed position to create an insulating air space between the original window pane (26) and the supplemental window pane (34); and
(e) a window blind (46) attached to a selected part of one of the sash (36) and the supplemental peripheral frame (28) so that the window blind (46) will be supported between the supplemental window pane (34) and the original window pane (26) when the sash (36) is in its closed position.

---

**4,369,829**

## WINDOW UNIT FOR STORM WINDOWS

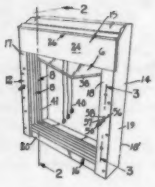
**John J. Casiday, 501 Third St., White Bear Lake, Minn. 55110**

**Filed Jun. 23, 1980, Ser. No. 161,860**
**Int. Cl.³ E06B 9/08**
**U.S. Cl. 160—120** **15 Claims**

1. A window unit for providing storm windows for use in conjunction with a transparent window panel having a predetermined area, wherein the unit comprises:
(a) a window casing;
(b) a plurality of substantially rectangular sealing frames carried in the window casing and superimposed on top of one another, wherein each of the sealing frames comprises spaced top and bottom frame members joined together by spaced left and right side frame members to define an open interior bounded by the frame members, wherein the

frame members are sufficiently spaced apart such that the open interior is at least approximately the same size as the area of the window panel, wherein the sealing frames are configured so that the corresponding frame members thereof are disposed in a mating face-to-face relationship, and wherein at least one of the sealing frames is movable in the window casing from a first position in which the sealing frames are spaced apart by a gap to a second position in which the sealing frames are pressed together;

(c) an air impervious plastic sheet carried in the window casing, wherein the plastic sheet is movable from an operative position in which the plastic sheet opposes and is substantially parallel to the window panel such that the plastic sheet defines the storm window and an inoperative position in which the plastic sheet is removed from its operative position, wherein the plastic sheet in its operative position is interposed into the gap between the sealing frames when the sealing frames are in their first position with the plastic sheet being sufficiently large to cover the open interior of the sealing frames, whereby the sealing frames in their second position will seal the plastic sheet



against air passage around the plastic sheet by the engagement of the corresponding frame members on the sealing frames with one another with the plastic sheet being trapped therebetween, wherein the plastic sheet is flexible and is carried on a spring roller located in the window casing, wherein the operative position of the plastic sheet is a position in which the sheet is unrolled from the spring roller and placed in the opposed relationship to the window panel, and wherein the inoperative position of the plastic sheet is a position in which the sheet is wound up on the spring roller, and wherein a lower edge of the plastic sheet is V-shaped to more easily pass between the sealing frames when the sealing frames are in their first position; and

(d) resilient sealing means attached to each of said sealing frames and extending continuously about said top, bottom, left, and right frame members of said frames to engage said plastic sheet when said sheet is in its operative position and when said at least one of the sealing frames is in its second position;

(e) wherein the window ca

---

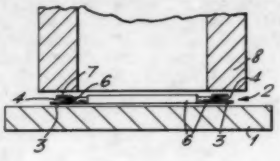
**4,369,830**

## SEALING JOINTS IN MOULDS

**Marcel Generali, Chilly-Mazarin, France, assignor to Foseco International Limited, Birmingham, England**

**Filed Feb. 11, 1981, Ser. No. 233,375**
**Int. Cl.³ B22D 7/08**
**U.S. Cl. 164—137** **5 Claims**

1. A method of sealing a joint between component parts of a metal mould for metal casting, utilizing an elongated sealing element which comprises a deformable sealant within a deformable tubular container, and a compressible sheet material cover, comprising the steps of: applying, in the area where the seal is desired between the parts of the metal mould, the elongated sealing element; and disposing the compressible sheet



material cover so that it separates the sealing element from each of the surfaces to be sealed together.

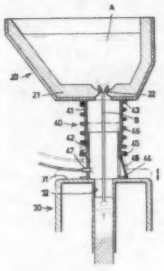
---

**4,369,831**

## PROTECTOR FOR MOLTEN METAL CASTING STREAM

**Kyozo Hayashi, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 804,170, Jun. 6, 1977, abandoned. This application Nov. 30, 1979, Ser. No. 99,029**
**Claims priority, application Japan, Jun. 10, 1976, 51-76274**
**Int. Cl.³ B22D 11/10**
**U.S. Cl. 164—415** **2 Claims**



1. In an apparatus for continuously casting a metal strand, said apparatus including a tundish having a bottom wall with a fixedly positioned and immovable gate therein, a vertically vibrating casting mold positioned beneath said tundish, said mold having an upper wall and a mold hole extending through said upper wall into said mold, and a protective device positioned between said gate of said tundish and said mold hole for protecting a flow of molten metal therebetween, the improvement wherein said protective device is a pipe assembly comprising:

a hollow first pipe having first and second ends, said first end having therearound a first flange, said first pipe being positioned with said first flange surrounding said gate of said tundish and being in direct contact with but unattached to said bottom wall of said tundish;

a hollow second pipe having first and second ends, said first end of said second pipe being telescopically fitted into said second end of said first pipe, said second end of said second pipe having therearound a second flange, said second pipe being positioned with said second flange surrounding said mold hole and being in direct contact with but unattached to said upper wall of said mold;

urging means, contacting said first flange and a portion of said second pipe, for urging said first and second pipes telescopically away from each other and for forcing said first and second flanges into direct contact with said bottom wall of said tundish and said upper wall of said mold, respectively, and for thereby forming an air-tight seal between said pipe assembly and said tundish and said

mold, and for removably and unattachably holding said pipe assembly between said tundish and said mold;

said entire pipe assembly being free of connection or attachment of any type to either said tundish or said mold; and

said second pipe having an inner cross-sectional area, throughout the entire length thereof, substantially equal to the cross-sectional area of said mold hole.

---

**4,369,832**

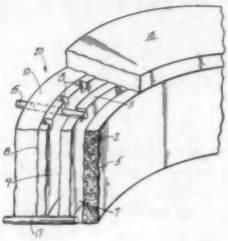
## CONTINUOUS LUBRICATION CASTING MOLDS

**Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Division of Ser. No. 84,768, Oct. 15, 1979. This application Apr. 1, 1981, Ser. No. 249,761**

**Int. Cl.³ B22D** *11/07*

**U.S. Cl. 164—472** **7 Claims**



1. A process for continuously casting molten metals or alloys comprising:

providing a continuous lubrication casting mold, said casting mold including a permeable casting mold section defining an inner casting surface, an outer lubricant receiving surface extending over substantially the entire length of said casting mold section, a molten metal or alloy inlet end, and an outlet end, said casting mold section comprising a porous body having a continuous open pore fraction associated therewith for establishing a set of passages for a lubricant, said open pore fraction varying along the length of said casting mold so that said open pore fraction is greater at said inlet end than at said outlet end;

passing said molten metal or alloy through said casting mold section; and

supplying said lubricant to said outer surface so that said lubricant passes through said first passages in said variable open pore fraction porous body and transfers onto said inner surface in a non-uniform manner along substantially the entire length thereof.

---

**4,369,833**

## TUBE SUPPORTS

**Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Inc., Chicago, Ill.**

**Filed Dec. 31, 1979, Ser. No. 108,813**

**Int. Cl.² F28F** *9/00*

**U.S. Cl. 165—67** **10 Claims**

1. A support for supporting a plurality of elongated tubes, having fins projecting from the upper and lower faces thereof, in parallel stacked relation to each other, said support comprising

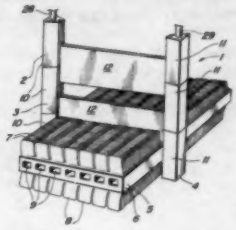
a. a plurality of supporting members

b. each of said supporting members comprising

(1) two oppositely disposed side members, and

(2) an elongated crossbar extending longitudinally between said side members,

c. said supporting members being disposed in stacked relation to each other with said side members on respective sides of said supporting members resting one on top of the other in aligned relation to each other in position to support said crossbars in spaced uniplanar relation to each other, in position to receive respective ones of such tubes



on the upper edge portions of respective ones of said crossbars, and

d. means for holding said supporting members in said stacked relation to each other.

---

**4,369,834**

## PROCESS FOR RECUPERATION OF HEAT FROM A GASEOUS CURRENT

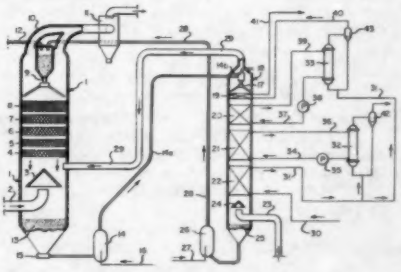
**Georges Meunier, Boulogne, and Jean-Francois Martin, La Celle Saint-Cloud, both of France, assignors to Tunzini-Nessi Enterprises d'Equipements, Paris, France**

**Filed Mar. 26, 1980, Ser. No. 133,989**

**Claims priority, application France, Mar. 27, 1979, 79 07605**

**Int. Cl.³ F28D** *19/02*

**U.S. Cl. 165—104.16** **12 Claims**



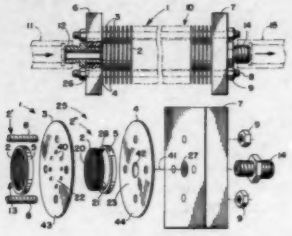
1. Process for recovering heat from a first hot gas current comprising the steps of introducing said first hot gas current into a first column having at least one stage made up of a stack of packing elements placed on a support grill, introducing cold separated solid particles into the top of said first column and allowing the particles to fall by gravity through said first column counter to said first gas current whereby the particles are heated, distributing the heated separated particles into the top of a second column and allowing the particles to fall by gravity through said second column, introducing a second gas current cooler than said heated particles into said second column counter to the direction of fall of said particles through said second column whereby said second gas current recovers heat from said particles, and introducing a heat carrying fluid which circulates in pipes in said second column and over which said second gas current flows whereby heat is transferred from said second gas current to said fluid.

4,369,835

## THERMAL ENERGY TRANSFER APPARATUS AND METHOD

Paul R. Goudy, Jr., 2415 Stratford Ct., Shorewood, Wis. 53211, assignor to Bruce J. Landis, Sunrise, Fla.; Kenneth J. Landis, University Heights, Ohio and Paul R. Goudy, Jr., Shorewood, Wis., a part interest

Filed May 8, 1980, Ser. No. 148,002
Int. Cl.³ F28D 7/10
U.S. Cl. 165—154 35 Claims



1. A thermal energy transfer apparatus, comprising fluid flow means for conducting the flow of fluid therethrough, including dispersing means for dispersing the fluid flowing through said fluid flow means, and thermal energy transfer means for transferring thermal energy with respect to said dispersing means for transfer between the latter and such fluid flowing therethrough, said dispersing means comprising a mesh-like material having substantial thermal energy conductive properties, said thermal energy transfer means comprising plural plate-like means having first surface area portions engaged with said dispersing means for thermal energy conduction therewith, said fluid flow means including openings in said plate-like means through which fluid may flow, and further comprising holder means for holding said dispersing means and thermal energy transfer means to provide a fluid-tight flow path therethrough, and said fluid flow means further comprising a fluid inlet and a fluid outlet for said fluid-tight flow path.

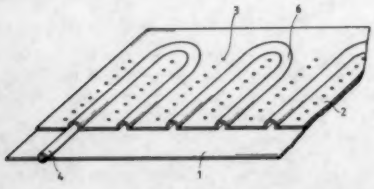
---

4,369,836

## HEAT EXCHANGE ASSEMBLY

Ingo Bleckmann, Ignaz-Rieder-Kai 11, A-5020 Salzburg, Austria

Filed May 14, 1980, Ser. No. 149,691
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919848
Int. Cl.³ F28F 1/32
U.S. Cl. 165—171 20 Claims



1. A heat exchange assembly comprising a metal carrier member, a pipe means carried by the metal carrier member for carrying a heat exchange medium, and metallic means for securing the pipe means to the carrier member, wherein at least one of the carrier member and the securing means has openings therethrough, the edge portion of each said opening being of a jagged configuration and projecting from the adjacent surface of the surrounding material, the edge portion of each said opening being pressed into the other of said carrier member and the securing means of the assembly and the material of said other of said carrier member and the securing means engaging into the openings thereby to form an anchoring means substantially of rivet head-like configuration.

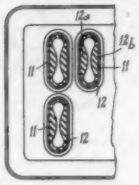
---

4,369,837

## TUBE FOR TUBE-PLATE HEAT EXCHANGERS

Jean-Pierre Moranne, Saint-Leu-La-Foret, France, assignor to Societe Anonyme des Usines Chausson, Hauts de Seine, France

Filed Feb. 4, 1981, Ser. No. 231,176
Claims priority, application France, Feb. 8, 1980, 80 02825
Int. Cl.³ F28F 9/06
U.S. Cl. 165—175 6 Claims



1. A tube for tube-plate heat exchanger, said tube having two ends with a cross section of an oblong shape having substantially flat larger sides and rounded smaller sides, the two ends being shaped so that the larger sides are formed with concavities making that in cross section, said two ends have a figure 8 shape over a portion of height corresponding at least to height of insertion of the tube in a tube plate, wherein each tube is inserted into a deformable gasket having, along larger sides of the tube, convergent overthicknesses, said gasket being maintained into a tube passage or a flange of an oblong shape.

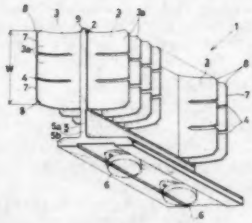
---

4,369,838

## DEVICE FOR RELEASING HEAT

Yoshihiko Asanuma, and Yoshihumi Shimajiri, both of Tochigi, Japan, assignors to Aluminum Kabushiki Kaisha Showa, Osaka, Japan

Filed May 27, 1980, Ser. No. 153,582
Int. Cl.³ F28F 7/00; H01L 23/36
U.S. Cl. 165—185 3 Claims



1. A heat releasing device comprising a radiating base plate integrally formed with: a multiplicity of tongue-like raised fins spaced apart from each other by a distance of 4–10 mm and having a height of 15–50 mm, on at least one side of the base plate by skiving, each of the skived fins being divided at least at its forward end into a plurality of portions by at least one slit to form divided portions each having a width of 8–25 mm on each fin; and a mount for attaching heat emitting elements which is provided with a horizontal portion, extending at a right angle from the lower edge of the radiating base plate, heat emitting elements being intimately attached to said hori-

zontal portion; wherein the radiating base plate is formed from an extruded blank and the skived fins are formed by cutting a fin forming portion having a plurality of projections provided with a lengthwise groove interposed therebetween, on at least one side of the blank.

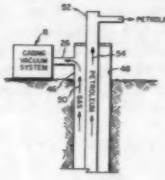
---

**4,369,839**

## CASING VACUUM SYSTEM

**Ronnie D. Freeman, and Elton R. Payne, both of Trent, Tex., assignors to F & P Production Co., Inc., Trent, Tex.**

**Filed Aug. 17, 1981, Ser. No. 293,257**
**Int. Cl.³ E21B *43/00***
**U.S. Cl. 166—53** **7 Claims**




1. An apparatus for applying a vacuum to the space within the casing of an oil well in order to improve the recovery of petroleum from the well, comprising:

(a) vacuum pump means having a suction inlet and a pressure outlet;

(b) a water accumulator means connected to the suction inlet of the vacuum pump means for preventing water and/or water vapor from entering the suction inlet of the vacuum pump means;

(c) a condensate accumulator means connected to the pressure oulet of the vacuum pump means for collecting gas which the vacuum means draws from the space within the casing of the oil well, condensing a portion of the gas into liquid hydrocarbons and collecting the liquid hydrocarbons;

and

an automatic pressure control means for maintaining the gas pressure in the casing of an oil well within a predetermined range by stopping the vacuum when the pressure is near the lower limit of the predetermined range and reapplying the vacuum when the pressure is near the upper limit of the predetermined range.

---

**4,369,840**

## ANCHOR AND ANCHOR POSITIONER ASSEMBLY

**David D. Szarka, and Eugene E. Baker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

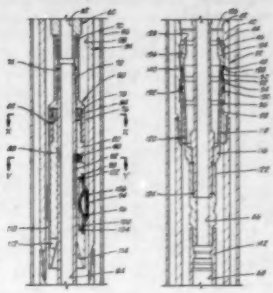
**Filed Dec. 27, 1979, Ser. No. 107,753**
**Int. Cl.³ E21B *23/00***
**U.S. Cl. 166—214** **20 Claims**

1. Apparatus for positioning and anchoring a tool string in at least one location in a well bore having conduit means disposed therein, comprising:

anchor means having at least one shoulder means thereon fixed to said conduit means at said at least one location in said well bore;

anchor positioner means attached to said tool string, said anchor positioner means including engagement means comprising at least one spring arm selectively changeable between a release mode and a retract mode, said spring arm being adapted in said release mode to engage said anchor shoulder means when placed adjacent thereto, and to disengage said anchor shoulder means in said retract mode; and

retraction means to effect said release and retract modes of said at least one spring arm of said engagement means, said retraction means having an inclined face thereon, and being axially slidable on said anchor positioner means responsive to movement of said tool string, said retraction means effecting said retract mode of said at least one spring arm by axial movement toward said at least one



spring arm and radially inwardly biasing contact of said inclined face therewith, and effecting said release mode by axial movement away from said at least one spring arm and substantial release therefrom.

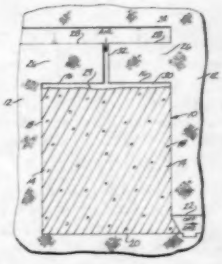
---

**4,369,841**

## METHOD FOR IGNITING AN IN SITU OIL SHALE RETORT

**Chang Y. Cha, Golden, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.**

**Filed Dec. 29, 1980, Ser. No. 220,850**
**Int. Cl.³ E21B *43/24***
**U.S. Cl. 166—251** **60 Claims**



9. A method for igniting an in situ oil shale retort in a subterranean formation containing oil shale, the retort containing a fragmented permeable mass of formation particles containing oil shale, comprising the steps of:

(a) establishing a primary combustion zone in the fragmented permeable mass of formation particles;

(b) establishing a secondary combustion zone in the fragmented permeable mass of formation particles upstream from the primary combustion zone for spreading the primary combustion zone laterally;

(c) withdrawing off gas from the fragmented permeable mass;

(d) monitoring the off gas for the concentration of methane; and

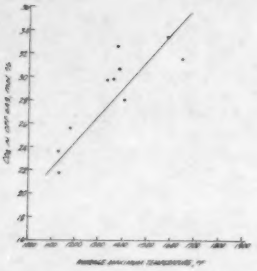
(e) extinguishing the secondary combustion zone when the concentration of methane in the off gas reaches a selected value.

**4,369,842**

## ANALYZING OIL SHALE RETORT OFF-GAS FOR CARBON DIOXIDE TO DETERMINE THE COMBUSTION ZONE TEMPERATURE

**Chang Y. Cha, Golden, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.**

**Filed Feb. 9, 1981, Ser. No. 232,575**
**Int. Cl.³ E21B *43/243;* G01N *31/12***
**U.S. Cl. 166—251** **15 Claims**



1. A method for determining the temperature of a processing zone in a fragmented permeable mass of formation particles in an in situ oil shale retort in a subterranean formation, the subterranean formation comprising kerogen and inorganic carbonates, the method comprising the steps of:

(a) forming an in situ oil shale retort containing a fragmented permeable mass of formation particles comprising kerogen and inorganic carbonates in the subterranean formation;

(b) advancing a processing zone through the fragmented permeable mass of formation particles for producing liquid and gaseous products from the kerogen, at least a portion of such inorganic carbonates being decomposed in the processing zone, forming inorganic oxides and gaseous carbon dioxide;

(c) withdrawing off-gas, including carbon dioxide from carbonate decomposition, from the retort on the advancing side of the processing zone, the carbon dioxide content of the withdrawn off-gas being a function of the temperature of the processing zone;

(d) determining the carbon dioxide content of the withdrawn off-gas; and

(e) correlating the carbon dioxide content of the withdrawn off-gas with the temperature of the processing zone.

---

**4,369,843**

## WELL COMPLETION AND WORK OVER METHOD

**Thomas C. Mondshine, Houston, Tex., assignor to Texas Brine Corporation, Houston, Tex.**

**Continuation-in-part of Ser. No. 735,168, Oct. 26, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,770**
**The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.**
**Int. Cl.³ E21B *33/138***
**U.S. Cl. 166—292** **5 Claims**

1. In a well completion and workover method wherein a subterranean formation in a well is contacted with a treating fluid, the steps comprising:

a. pumping the treating fluid in the well and contacting the formation with said treating fluid wherein said treating fluid comprises:

(1) a saturated aqueous saline solution with at least one water soluble salt which is substantially insoluble in the saturated saline solution;

(2) said saturated aqueous saline solution being formed from, and said water soluble salt being selected from one or more of the group consisting of potassium chloride, sodium chloride, calcium chloride, sodium sulfate, sodium carbonate, sodium bicarbonate, calcium bromide and potassium carbonate; and

(3) said treating fluid also including a minor amount of a fluid loss additive to inhibit loss of fluid into the formation and a suspension additive to prevent settling of the water soluble salt particles;

b. controlling the pressure in the well during the workover and completion by maintaining the quantity of said water soluble salt weighing particles present in the saturated aqueous saline solution in the range of approximately 10 pounds per barrel to about 900 pounds per barrel of saturated aqueous saline solution;

c. forming a bridge and seal on the formation to bridge and seal off the formation by maintaining said water soluble salt which is substantially insoluble in the saturated saline solution in a particle size range of about 5 microns to about 800 microns with greater than about 5% of the particles being coarser than 44 microns; and

d. dissolving the water soluble salt bridging and weighting particles off the formation to remove the bridge and seal from the formation for flow of hydrocarbons therefrom into the well.

---

**4,369,844**

## METHOD USING LOST CIRCULATION MATERIAL FOR SEALING PERMEABLE FORMATIONS

**Elmer E. Clear, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 77,215, Sep. 20, 1979, Pat. No. 4,289,632. This application Jun. 29, 1981, Ser. No. 278,127**
**Int. Cl.³ C09K *7/02, 7/06;* E21B *33/138***
**U.S. Cl. 166—294** **18 Claims**

1. A method for sealing permeable formations, said method comprising:

preparing a lost circulation material slurry comprising a fluid selected from the group consisting of fresh water, salt water and oil and a solid comprising, based on the total weight of said solid, from about 2 to about 30 weight percent finely divided paper effective as a suspending agent and from about 70 to about 98 weight percent diatomaceous earth;

spotting a slug of the thus-prepared slurry adjacent a permeable formation in a well bore;

defluidizing the thus spotted slurry to deposit a formation seal adjacent said permeable formation; and

circulating a drilling mud to form a mud sheath on said formation seal.

---

**4,369,845**

## OIL WELL BLOW-OUT CONTROL

**George S. Henson, Grange-over-Sands, and Joe Brooks, Emsworth, both of England, assignors to Mobell Blowout Services Limited, Dyce, England**

**Filed Jul. 24, 1980, Ser. No. 171,843**
**Claims priority, application United Kingdom, Jul. 26, 1979, 7926138; Mar. 3, 1980, 8007108**
**Int. Cl.³ E21B *29/08, 29/12, 33/037, 33/076***
**U.S. Cl. 166—298** **29 Claims**

1. A device for bringing an implement to bear on an inner tubular of a multi-tubular well for a blow-out control operation, said device comprising:

a support attachable to an outer tubular of a well;

an implement holder connected to said support and having a bore therethrough having first and second ends, and a valve for opening and closing communication through said bore, said implement holder being sealingly engagable with an inner tubular of a well at a peripheral edge of the first end and to detachably sealingly receive an implement at a peripheral edge of the second end;

a back-up unit connected to the support and sealingly engageable with the inner tubular at a position diametrically opposite to said implement holder;

a support connection for connecting said implement holder and said back-up unit to said support; and

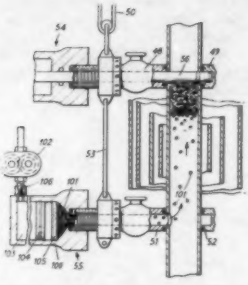
a clamping means for engaging said implement holder and said back-up unit with the inner tubular.

27. A method of boring and blocking an inner tubular of a multi-tubular well during a blow-out control operation comprising the steps of:

(1) cutting a pair of opposite windows in diametrically opposite peripheral parts of an outermost tubular of the well;

(2) attaching a support to the outermost tubular;

(3) connecting an implement holder and a back-up unit to the support;



(4) inserting the implement holder and back-up respectively through the opposite windows;

(5) sealingly engaging a peripheral edge of a first end of a bore through the implement holder with the inner tubular;

(6) clamping the implement holder and back-up unit to the inner tubular;

(7) detachably sealingly connecting a boring mechanism to a peripheral edge of a second end of the bore;

(8) advancing a spindle which is sealingly engaged within the boring mechanism through the bore; and

(9) boring a hole in the inner tubular with a tool bit attached to the spindle.

---

**4,369,846**

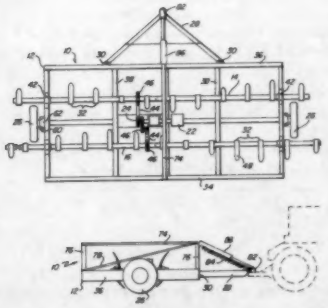
## TILLING MACHINE FOR SANDY SOIL

**Harry D. Lockhart, 2965 S. Acoma St., Englewood, Colo. 80110**

**Filed Jul. 20, 1981, Ser. No. 285,065**

**Int. Cl.³ A01B *33/02***

**U.S. Cl. 172—60** **11 Claims**



1. A tilling machine adapted for use with sandy soil, comprising:

(a) a frame carrying at least two parallel transverse rotatable digger shafts, each shaft carrying a plurality of broad-faced sand diggers, said diggers being laterally spaced apart by a distance greater than the face of a digger such that an untilled ridge remains between furrows created by the passage of all diggers on said shafts;

(b) a pair of wheels connected to said frame on a single transverse axis parallel to and intermediate said two digger shafts, each wheel having associated therewith a mounting means for variably adjusting the vertical height of the wheel with respect to the frame;

(c) hitch means for connecting the frame to a source of locomotion;

(d) tilting connection means between said hitch means and frame for allowing the frame to be tilted on the axis of said pair of wheels;

(e) a longitudinal tilt arm connected to said frame for application of tilting forces;

(f) length adjustable tie-down means connected to said tilt arm and fastenable to, in use, an object outside said frame for biasing the tilt arm to a preferred position of tilt; and

(g) digger shaft rotating means.

---

**4,369,847**

## BLADE ASSEMBLY

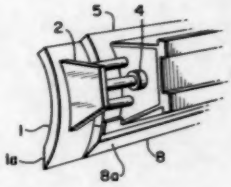
**Wataru Mizunuma, Sagamihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 12, 1980, Ser. No. 215,926**

**Claims priority, application Japan, Jan. 30, 1980, 55-9815[U]**

**Int. Cl.³ E02F *3/76***

**U.S. Cl. 172—815** **1 Claim**



1. A blade assembly for use on grader or construction vehicles, said blade assembly comprising:

a main blade adapted to be mounted on a vehicle;

at least one auxiliary blade mounted on the end of said main blade; and

means for varying the total blade width of the assembly by sliding said auxiliary blade laterally with respect to said main blade along respective complementary sliding surfaces of said main and auxiliary blades;

said main and auxiliary blades having respective lower edge portions defined by respective tapered surfaces forming respective lower knife edges, said edge portions being positioned in back-to-back relation, said respective tapered surfaces converging downwardly and being inclined upwardly in opposite directions away from said complementary sliding surfaces, and said respective knife edges being aligned in the same straight line;

said main and auxiliary blades-and said respective complementary surfaces thereof being curved about a common axis extending generally parallel said same straight line.

---

**4,369,848**

## CONTROL SYSTEM FOR A ROCK DRILL

**Pekka Salmi, and Aimo Helin, both of Tampere, Finland, assignors to Oy Tampella Ab, Finland**

**Filed May 7, 1979, Ser. No. 36,550**

**Claims priority, application Finland, May 11, 1978, 781485**

**Int. Cl.³ E21C *5/16***

**U.S. Cl. 173—8** **2 Claims**

1. A control system for operating a hydraulic drilling machine, the drilling machine includes a body, a drill steel recip-

rocatingly and rotatably supported by the body and having a shank at its rear end inside the body, a striking apparatus with a striking piston adapted to strike against the shank, a rotation motor with gear means adapted to rotate the drill steel in either direction, a feed motor operating a feed device to cause forward and return movements of the drilling machine, and a shank cylinder with a shank piston therein adapted to retract the drill steel with the shank in a striking contact with the striking piston when a pressure medium is supplied to the shank cylinder, the control system comprising:

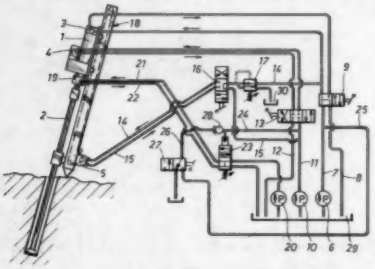
first means for supplying a pressure medium coupled through a first pair of supply and return lines to the striking apparatus,

second means for supplying a pressure medium coupled through a second pair of supply and return lines to the rotation motor,

wherein said first means for supplying a pressure medium has a higher pressure than does said second means for supplying a pressure medium,

manually operable valve means in said second pair of supply and return lines, said valve means being a directional valve adapted to reverse the direction of flow of the medium thereby to cause the rotation motor to rotate the drill steel in either direction,

a third pair of supply and return lines for the feed motor, a supply line of said third pair is connected to a supply line of said first pair and a return line of said third pair is connected to a supply line of said second pair so as to



normally operate the feed motor with a pressure differential therebetween,

third means for supplying a pressure medium coupled through a fourth pair of supply and return lines to the shank cylinder,

first pressure controlled valve means associated with said supply line of said third pair of supply and return lines, said first pressure controlled valve means being adapted to sense a predetermined increased pressure in said supply line of said second pair of supply and return lines, said pressure being increased due to increased rotation resistance encountered by the drill steel, and to change from one flow condition to another disconnecting said supply line of said third pair of supply and return lines from said supply line of said first pair and connecting said supply line of said third pair of supply and return lines to a tank, thereby reversing the direction of flow of pressure medium in the feed motor causing that motor to reverse the feed direction,

second pressure controlled valve means associated with said fourth pair of supply and return lines for the shank cylinder with a pressure control line of said second valve connected to said rotation supply line of said second pair of supply and return lines, said second pressure controlled valve means being adapted to change from a closed to an open condition at a predetermined rotational pressure in said control pressure line thereby allowing pressure medium to enter the shank cylinder through a supply line of said fourth pair and choking a return line of said fourth pair in order to cause pressure to rise in front of the shank piston thereby to cause the retracting operation of the shank piston to take place,

the predetermined rotational pressure selected to actuate said second pressure controlled valve means substantially corresponding to the predetermined increased pressure sensed to change the feed direction,

said first and second pressure controlled valve means returning to said initial flow conditions once the second pressure has dropped below said selected value.

---

**4,369,849**

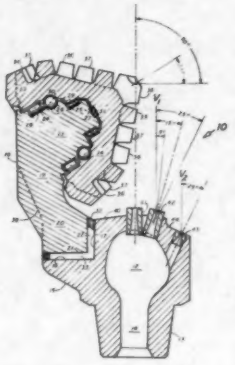
## LARGE DIAMETER OIL WELL DRILLING BIT

**John D. Parrish, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.**

**Filed Jun. 5, 1980, Ser. No. 156,883**

**Int. Cl.³ E21B** *10/18, 10/20*

**U.S. Cl. 175—340** **7 Claims**



1. An oil well tricone rolling cutter drilling bit for drilling top hole and large diameter boreholes, said bit comprising:

an integrally formed cast metal body member having a pin end, a central bore passage, and three equispaced platform arms formed thereon;

said platform arms each having a plurality of alignment surface means comprising two different planes for a lug assembly in abutting relationship while permitting vertical, horizontal, and skew adjustment during assembly and adapted to support a lug assembly of a size selected from at least two different sizes;

a lug assembly of a size selected from at least two different sizes welded to each of said platform arms and having a lug member with a leg section at its attachment end and a bearing journal extending radially inwardly at its opposite end; said journal being adapted to support a cutter of a size selected from at least two different sizes; said lug assembly further having a frustoconical cutter of a size selected from at least two different sizes rotatably mounted on said bearing journal by bearing means, and

said body member and said lug member forming one of at least two differently sized drilling bits of significantly different diameters.

---

**4,369,850**

## HIGH PRESSURE FLUID JET CUTTING AND DRILLING APPARATUS

**Clark R. Barker, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.**

**Filed Jul. 28, 1980, Ser. No. 173,264**

**Int. Cl.³ E21B** *10/60*

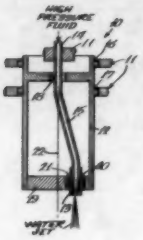
**U.S. Cl. 175—393** **9 Claims**

1. A high pressure fluid jet drilling and cutting system

adapted to be connected to a source of high pressure fluid, and comprising:

a fluid jet nozzle for ejecting a high velocity fluid jet stream;

a non-rotating fluid supply conduit interconnecting said nozzle with said source of high pressure fluid; and



eccentric drive means including a rotatable cylindrical shell surrounding said conduit attached to said nozzle and operable to move said nozzle in a general circular path without rotating said nozzle with respect to said supply conduit.

---

**4,369,851**

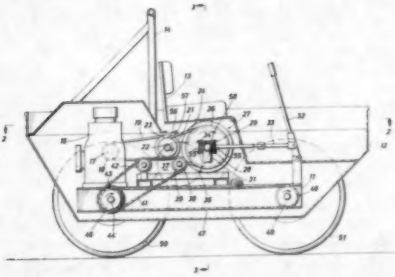
**TRANSMISSION SYSTEM**

**Joseph D. LaBorde, 1165 N. Main, Vidor, Tex. 77662**

**Filed Oct. 23, 1980, Ser. No. 200,253**

**Int. Cl.³ B62D *11/02***

**U.S. Cl. 180—6.66** **7 Claims**



1. A vehicle in which driving power is applied separately to opposite sides of the vehicle including:

a frame;

an engine mounted on said frame;

left and right traction means on opposite sides of said frame;

a rotatable drive means operatively connected to said engine and rotated thereby, said drive means having a power transmission system mounted thereon for rotation therewith;

a left rotatable driven means operatively connected to said left traction means;

a right rotatable driven means operatively connected to said right traction means;

a left control means having first and second transmission means arranged for power connection with said transmission system of said drive means and operatively connected to said left driven means for rotating said left driven means in respective opposite directions, said left control means being mounted for movement with respect to said frame between a first position operatively connecting said first transmission means and disconnecting said second transmission means with said transmission system of said drive means and a second position connecting said second transmission means and disconnecting said first transmission means with said transmission system of said drive means;

a right control means having first and second transmission means arranged for power connection with said transmission system of said drive means and operatively connected to said right driven means for rotating said right driven means in respective opposite directions, said right control means being mounted for movement independently of said left control means and with respect to said frame between a first position operatively connecting said first transmission means and disconnecting said second transmission means with said transmission system of said drive means and a second position connecting said second transmission means and disconnecting said first transmission means with said transmission system of said drive means.

---

**4,369,852**

**POWER STEERING APPARATUS FOR VEHICLES**

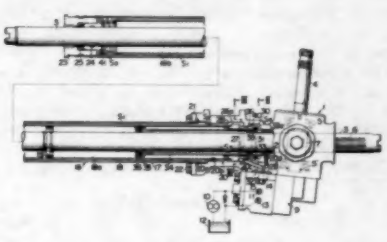
**Masao Nishikawa, Ooizumigakuen; Yoshihiko Toshimitsu, Asaka; Akira Iwasaki, Oomiya, and Katsuhiko Fujimoto, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 21, 1981, Ser. No. 226,911**

**Claims priority, application Japan, Jan. 30, 1980, 55-9814**

**Int. Cl.³ B62D *5/010*; F15B *15/002***

**U.S. Cl. 180—148** **10 Claims**



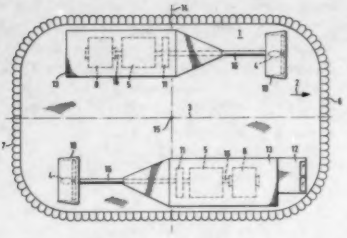
1. Power steering apparatus for a vehicle comprising a steering gear casing, a rack rod operatively connected to a steering wheel and slidably supported in said steering gear casing, a power cylinder connected for hydraulically driving said rack rod, control valve means connected to said steering gear casing for controlling the operation of said power cylinder, said control valve means having two output ports respectively and selectively connected to a fluid pressure source and a fluid return line to said source, said power cylinder comprising an outer cylinder fixed at an inner end portion thereof to said steering gear casing, an inner cylinder disposed inside said outer cylinder and secured at an inner end portion thereof to said steering gear casing, and a piston fixedly mounted on said rack rod and dividing the interior of said inner cylinder into a first fluid chamber close to said steering gear casing and a second fluid chamber remote from said casing, means including a coil spring supporting said inner cylinder in a floating state at its outer end on said outer cylinder, said coil spring having windings forming spaces of constant width therebetween, said second fluid chamber and the interior of said outer cylinder being in communication with each other via said spaces of constant width in said coil spring, and passage means for providing communication between said output ports of said control valve means and said first fluid chamber and the interior of said outer cylinder separately, said passage means being provided in said steering gear casing.

4,369,853

## AIR-CUSHION VEHICLE

Pentti Heijola, Espoo, and Fredrik Burmeister, Helsinki, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Dec. 8, 1980, Ser. No. 213,833
Claims priority, application Finland, Dec. 14, 1979, 793935
Int. Cl.³ B60V *1/14*
U.S. Cl. 180—117 7 Claims



1. An air-cushion vehicle comprising a hull, two air propulsion units located at a considerable distance from each other and one or several drive engines for said propulsion units, one of said propulsion units being located at the front end of said vehicle at one side of its longitudinal axis, the other of said propulsion units being located at the rear end of said vehicle at the opposite side of said axis.

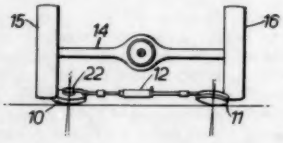
---

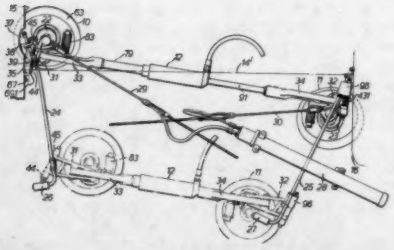
4,369,854

## PARKING DEVICES FOR VEHICLES

Archibald J. Butterworth, 7 Frimley Grove Gardens, Frimley, Camberley, Surrey, England

Continuation-in-part of Ser. No. 57,232, Jul. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 910,049, May 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 783,598, Apr. 1, 1977, abandoned. This application Feb. 19, 1981, Ser. No. 236,080
Claims priority, application United Kingdom, Oct. 2, 1975, 40232/75
Int. Cl.³ B60K *25/08*
U.S. Cl. 180—201 39 Claims



1. A parking device for a motor vehicle, comprising a pair of parking rollers rotatably mounted in respective roller mounting members which are connected to respective ends of an extensible power means and which are arranged to be transported along respective rails on extension or retraction of the power means, each rail being adapted to extend from a mounting on the sprung part of the vehicle under the floor of the vehicle downwardly and outwardly to a location adjacent to a respective one of a pair of road wheels of the vehicle, so that extension of the power means will cause the assembly of parking rollers, roller mounting members and power means to move bodily from a retracted position clear of the road and adjacent to the upper ends of the rails to an operative position adjacent to the said pair of road wheels, in which operative position the parking rollers will take the weight of the adjacent end of the vehicle and enable it to be moved sideways.

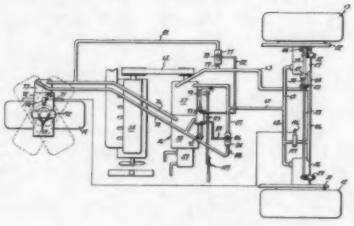
---

4,369,855

## FLUID DRIVE SYSTEM

Floyd E. Buschbom, Long Lake, Minn., and Marion Hutchison, Waterloo, Iowa, assignors to Veda, Inc., Long Lake, Minn.

Filed Jul. 15, 1960, Ser. No. 169,191
Int. Cl.³ B60K *17/10*; F15B *18/00*
U.S. Cl. 180—212 27 Claims



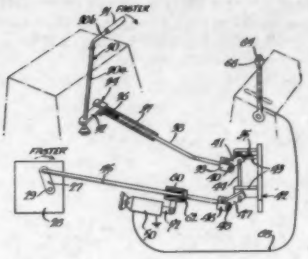
1. A land vehicle comprising: a frame, first wheel means and second wheel means connected to the frame to support the frame on the ground, first drive means operably connected to the first wheel means to rotate said first wheel means, said first drive means having fluid operated first motor means, second drive means operably connected to the second wheel means, said second drive means having fluid operated second motor means, first pump means for supplying fluid under pressure to a first fluid circuit connected to the first motor means, second pump means for supplying fluid under pressure to a second fluid circuit connected to the second motor means, means for concurrently operating the first and second pump means whereby said first and second pump means supplies fluid under pressure to the first and second fluid circuits thereby operating said first and second motors to drive the first and second wheel means, said first and second pump means each having control means operable to vary the rate of flow of fluid discharged by the first and second pump means, means connected to the control means of the first and second pump means, and said means connected to the control means of the first and second pump means includes means operable in response to a difference in the pressure of the fluid in the first and second fluid circuits to actuate the control means of second pump means to alter the rate of flow of fluid discharged by the second pump means to substantially balance the pressure of the fluid in the first and second fluid circuits thereby maintaining the torque and speed input to the first and second drive wheel means substantially constant.

4,369,856

## BACKHOE CONTROL WITH HAND THROTTLE AND ELECTRIC THROTTLE CONTROL

Barry C. Nudd, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 29, 1980, Ser. No. 191,751
Int. Cl.³ B60K 26/00
U.S. Cl. 180—321 9 Claims



1. In a backhoe on a vehicle having an engine and a frame, said backhoe having a tower pivoted about a fixed pivot axis by a hydraulic control system powered by said engine, the improvement comprising means for adjusting the speed of said engine to control the flow of fluid in said hydraulic control system, comprising:

axially extending plunger means having one end operatively connected to said engine, said plunger means being movable along its axis for controlling the speed of said engine,

stop means positioned on said plunger means,

lever means having one end operatively connected to the other end of said plunger means, and an opposite end engageable by the vehicle operator, said lever means being movable between a first position in which said plunger means is in a first position said engine speed is relatively slow, and a second position in which said plunger means is in a second position and said engine speed is relatively fast, and being positionable at intermediate positions therebetween,

engagement means positioned adjacent to said plunger means and movable in the direction of the axis of said plunger means, said engagement means being adapted to abut said stop means and move said stop means and said plunger means along the axis of said plunger means,

piston means supported by said vehicle frame and having one end operatively connected to said engagement means, said piston means being movable between a retracted position and an extended position, said piston means comprising an electric solenoid that is secured to said vehicle frame, said solenoid having a piston rod that is operatively connected to said engagement means and is movable between a retracted position and an extended position,

means for activating said piston means to move said piston means from said retracted position to said extended position, and for deactivating said piston means,

spring means having one end secured to said vehicle frame and an opposite end operatively connected to the other end of said plunger means, such that movement of said plunger means towards said second position increases the tension in said spring means, and the tension in said spring means causes said spring means to move said plunger means toward said first position when said piston means is deactivated,

whereby an operator can move said lever means to an intermediate position between said first position and said second position which moves said plunger means to an intermediate position corresponding to an intermediate engine speed, and said operator can increase the speed of said engine to a speed greater than said intermediate speed by activating said piston means which moves said engagement means into engagement with said stop means and moves said plunger means towards said second position, whereupon said operator can decrease the speed of said engine to said intermediate speed by deactivating said piston means, and said operator can further decrease the speed of said engine by moving said lever means from said intermediate position towards said first position.

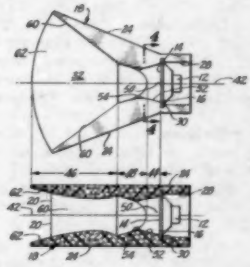
---

4,369,857

## LOUDSPEAKER AND HORN COMBINATION

Spencer Frazer, and Steven P. Solbelman, both of Los Angeles, Calif., assignors to The Kind Horn Company, Los Angeles, Calif.

Filed Jan. 22, 1981, Ser. No. 227,394
Int. Cl.³ G10K 13/00
U.S. Cl. 181—159 8 Claims



1. A horn loudspeaker system including a speaker having a diaphragm and a horn provided with an internal horn cavity, said cavity having an entrance and an exit, said horn being located so that said diaphragm is positioned so as to extend across said entrance to said cavity and so that said horn cavity extends outwardly away from said diaphragm in which the improvement comprises:

said horn cavity having a centrally located axis which is perpendicular to the center of said diaphragm and being bilaterally symmetrical about a plane passing through said axis,

said horn cavity including a sound chamber region, a transitional region, and a flare region located so that said sound chamber region extends from said entrance toward the interior of said cavity and so that said flare region extends from within the interior of said cavity to said exit, said sound chamber and flare regions being separated by said transitional region,

said sound chamber region including a throat extending transverse to said axis intermediate the ends thereof which is of lesser cross-sectional area than any other part of said sound chamber region and being defined by at least one wall having a continuous, smooth curvature extending between the ends of said sound chamber region,

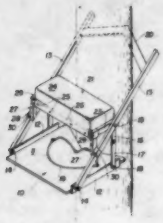
said flare region being defined by two substantially flat walls located at an angle with respect to one another and two curved walls extending between said flat walls, said walls of said flare region diverging outwardly away from said sound chamber region, said curved walls of said flare region having a gradually increasing curvature in accordance with the distance from said sound chamber region, said transitional region being shaped so as to provide a substantially smooth transition between the adjacent ends of said sound chamber region and said flare region.

**4,369,858**

## HUNTER'S TREE STAND AND SEAT

Alvin A. Babb, 106 Walnut St., Smyrna, Tenn. 37167

Filed Feb. 17, 1981, Ser. No. 234,488
Int. Cl.³ A01M *31/02*; A45F *3/26*; A47C *9/10*
U.S. Cl. 182—134 5 Claims



1. In a hunter's tree climbing platform having a platform body portion which is level during use and a folding support frame including inclined side frame members carrying aligned pivot elements, the improvement which comprises a drop seat which is level during use and which can drop by gravity to a vertical position to facilitate climbing, opposite sides of the drop seat being pivotally connected to said pivot elements and being supported thereby near the rear of the seat, and a pair of readily removable adapter legs supporting the seat near its front in said level use position, the adapter legs each having a top channel engaging element embracing a side member of the seat and each having a bottom channel engaging element embracing said inclined side frame members, the bottom channel engaging elements having their axes inclined and parallel to the axes of the side frame members and convergent with the axes of the top channel engaging elements, whereby the adapter legs are self-locking in their positions of use.

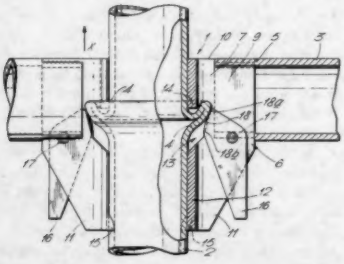
---

**4,369,859**

## SCAFFOLDING SYSTEM

Marinus A. L. Smits, Henley-on-Klip, South Africa, assignor to SGB Group Limited, Surrey, England

Filed Jan. 15, 1981, Ser. No. 225,385
Claims priority, application South Africa, Jan. 15, 1980, 80/0225
Int. Cl.³ E04G *7/30*
U.S. Cl. 182—179 10 Claims



1. A scaffolding system, said system including a first scaffold member, and a second scaffold member substantially perpendicular thereto, said second member being connected to the first member by means of a joint; said joint comprising an annular protruding formation on said first member, said protruding formation being substantially uniform around the periphery of said first member, a housing mounted on one end of the second member, a lever pivotally mounted on the housing, the lever defining a cam face, means on the housing to engage the said annular protruding formation with the said second member in any selected radial orientation to the first member and with the lever in a position such that the said cam face can be brought into locking engagement with the annular protruding formation to lock the members together.

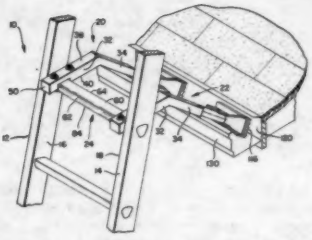
---

**4,369,860**

## LADDER WITH BRACKET ATTACHMENTS

Tim E. Beane, 1008 Lima St., Wapakoneta, Ohio 45895

Filed Dec. 3, 1980, Ser. No. 212,379
Int. Cl.³ E06C *7/48*
U.S. Cl. 182—214 9 Claims



1. A ladder with bracket attachments comprising:
a pair of brackets for attachment to the rung of a ladder each having a horizontal leg and a depending leg;
each horizontal leg having top and bottom walls and side walls;
cut-out means on said bottom and said side walls defining slot means which seat on the rung of a ladder;
means cooperating with said slot means and said rung for securing each of said pair of brackets to said rung;
each depending leg having an open end with threaded means therein;
an extensible member threadedly received within said threaded means of each depending leg; and
foot means secured to each extensible member for engagement against the inside wall of a gutter.

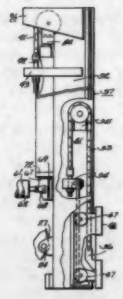
---

**4,369,861**

## MULTIPLE SECTION MAST WITH A PAIR OF LIFT JACKS BEHIND THE PRIMARY SECTION UPRIGHTS

David W. Rietman, Highland, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 10, 1980, Ser. No. 205,745
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 E 1 Claim



1. A lift truck having a mast pivotally connected near its

lower end to the truck chassis for tilting movement about a horizontal tilt axis and means for tilting said mast about said tilt axis, characterized by,

primary, secondary and tertiary sections each with two laterally spaced uprights, said primary section being pivotally connected at its lower end to said truck chassis, said secondary section being mounted on said primary section for vertical reciprocating movement thereon, said tertiary section being mounted on said secondary section for vertical reciprocating movement thereon,

a load carriage supported on said tertiary section for raising and lowering movement relative thereto,

said means for tilting said mast including a pair of linear hydraulic tilt jacks having first corresponding end pivotally connected to said chassis and second corresponding ends pivotally connected, respectively, to said uprights of said primary section a substantial distance above said tilt axis,

a first horizontal cross tie having its opposite ends secured to said secondary section uprights near their upper ends,

a pair of three-element lift jacks having corresponding lower ends of their outer stationary elements supported on the rear of said uprights, respectively, of said primary section above said pivot connections between said tilt jacks and said primary section uprights, the corresponding upper ends of inner elements of said three-element jacks being connected in lifting relation to said first cross tie, an intermediate element and said inner element of each three-element jack being extended from its outer stationary element when said jack is expanded,

a second horizontal cross tie having its opposite ends secured to said primary section uprights near the elevation of the top of said outer elements of said lift jacks said second cross tie passing to the rear of said three-element lift jacks without connection thereto,

a third horizontal cross tie having its opposite ends secured to the upper ends of said uprights of said primary section, said third cross tie being above said first cross tie when said mast is in its lowered condition, said third cross tie being disposed rearwardly a sufficient distance to permit said intermediate and inner elements of said three-element jacks and said first cross tie to move upwardly without interference with said third cross tie when said three-element jacks are expanded causing said tertiary section to move upwardly relative to said secondary section and said secondary section to move upwardly relative to said primary section thereby achieving full vertical extension of said mast,

a pair of pulleys rotatably mounted on horizontal axes on said first cross tie,

a pair of flexible members having first corresponding ends connected to said second cross tie, intermediate portions operatively engaging said pulleys, respectively, and second corresponding ends connected to said tertiary section, and

a linear hydraulic jack mounted on said tertiary section having an extensible element operatively connected to said carriage and constituting the sole means for raising and lowering said carriage between opposite vertical ends of said tertiary section.

---

**4,369,862**

## DISC BRAKE ASSEMBLY FOR VEHICLE USE

**Masayuki Seki, Tateshina, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Kagano, Japan**

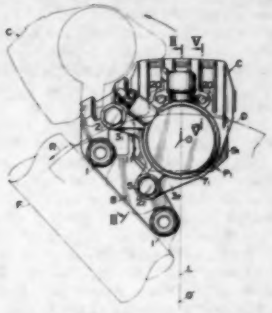
**Filed Feb. 17, 1981, Ser. No. 234,758**

**Claims priority, application Japan, Feb. 18, 1980, 55-18666; Feb. 18, 1980, 55-19298[U]; Feb. 18, 1980, 55-19300[U]; May 1, 1980, 55-60146[U]**

**Int. Cl.³ F16D *65/02***

**U.S. Cl. 188—73.45** **12 Claims**

1. A disc brake assembly for use in a vehicle having a fixed part, said assembly comprising a brake disc, having an axis of rotation, a piston adjacent to the brake disc, a bracket fixed to the fixed part of the vehicle in the piston adjacent to the brake disc, a first and a second brake pad arranged on opposite sides of the brake disc, a brake caliper having a first and a second limb formed to straddle the brake pads and including in the first limb pressure means for exerting pressure on the back of the first brake pad, first and second slide pins on the bracket to connect the brake caliper therewith while allowing the brake caliper to slide in a direction parallel to the axis of rotation of the brake disc, the bracket being arranged wholly on the forward side of the brake caliper with respect to the direction of rotation of the brake disc, the first and second slide pins being substantially aligned with each other radially of the brake disc, and hanger pin means, the first and second brake pads being hung on the brake caliper by said hanger pin means so as to be held in abutting engagement with a torque-bearing surface formed on the bracket only along the forward side edges of the respective brake pads with respect to the direction of rotation of the brake disc.



---

**4,369,863**

## INTERNAL SHOE DRUM BRAKES FOR VEHICLES

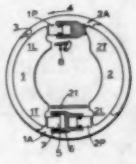
**Glyn P. R. Farr, Leek Wootton, and Colin S. Matthews, Dormansland, both of England, assignors to Lucas Industries Limited, Birmingham, England**

**Filed Aug. 29, 1980, Ser. No. 182,502**

**Claims priority, application United Kingdom, Aug. 31, 1979, 7930349; Oct. 25, 1979, 7937000**

**Int. Cl.³ F16D *65/24***

**U.S. Cl. 188—106 A** **7 Claims**



1. An internal shoe-drum brake for a vehicle comprising first and second arcuate shoes carrying friction linings for engagement with a rotatable drum, each of said shoes having a first end and a second end, an hydraulic actuation system for applying said shoes to said drum for normal service braking, and a mechanical actuation system operable independently of said hydraulic actuation system for applying said shoes to said drum for parking or emergency braking, said first ends of said shoes constituting leading ends for one direction of drum rotation and trailing ends for the other direction of drum rotation, and said second ends of said shoes constituting trailing ends for said one direction of drum rotation and leading ends for said other direction of drum rotation, wherein said hydrau-

lic actuation system comprises a first hydraulic actuator which acts on said leading end of said first shoe and a second hydraulic actuator which acts on said leading end of said second shoe whereby, for said normal service braking, said brake acts as a brake of the two-leading shoe type, and said mechanical actuation system acts on the leading end of only one of said shoes, and means are incorporated for transmitting thrust from the trailing end of the said one shoe to the leading end of the other of said shoes whereby, for said parking or emergency braking, said brake acts as a brake of the duo-servo type, said first hydraulic actuator comprising a first piston disposed at said leading end of said first shoe, said second hydraulic actuator comprises a second piston disposed at said leading end of said second shoe, means for supplying hydraulic fluid under pressure to said first and second pistons to apply said shoes to said drum, and first and second abutments against which said trailing ends of said shoes are adapted to rest, one of said abutments being fixed with respect to the respective one of said shoes, and the other of said abutments including an auxiliary hydraulic piston, a fixed stop with which said auxiliary piston is engageable, and means for subjecting said auxiliary piston to said hydraulic fluid under pressure to urge said auxiliary piston against said fixed stop at least when said hydraulic fluid under pressure is supplied to said first and second pistons in opposition to the reaction from the trailing end of one of said shoes which is in engagement with said auxiliary piston, the area of said auxiliary piston being chosen such that said auxiliary piston is held against said stop to counter said reaction from said trailing end of said one of said shoes, said means for transmitting thrust comprising a floating mechanical strut operating between said shoes to transmit said reaction from said trailing end of the said one of said shoes to said leading end of the other of said shoes when no hydraulic pressure is applied to said auxiliary piston.

---

**4,369,864**

## SHOCK ABSORBER INCLUDING THERMOSTATICALLY CONTROLLED FLUID FLOW PASSAGE

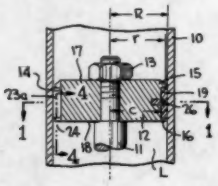
**Christian B. de Carbon, 64, Boulevard Maurice-Barres, 92 Neuilly-sur-Seine, France**

**Continuation of Ser. No. 35,544, May 3, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,529**

**Claims priority, application France, May 5, 1978, 78 13303**

**Int. Cl.³ F16F 9/52**

**U.S. Cl. 188—277** **11 Claims**




1. A hydraulic shock absorber, comprising a cylindrical casing having an inner diameter enclosing a working chamber containing a hydraulic fluid, and a piston adapted to reciprocate in said working chamber, said piston including a piston rod and a cylindrical piston head connected to said rod, the hydraulic fluid being adapted to pass between opposite sides of said piston head during the reciprocation, a non-metallic ring surrounding the peripheral wall of said piston head, said ring comprising a material selected from the group consisting of a flourine-based resin, an acetal resin or a polyamide, said piston head being devoid of any permanent flow passages within the area delimited by said peripheral wall, said head comprising a material having a first coefficient of expansion, and said ring material having a coefficient of expansion higher than said first coefficient of expansion, circular flanges at said opposite sides of said piston head extending radially outwardly of said peripheral wall and having outer diameters slightly less than said inner diameter, said ring being discontinuous by having at least one pair of opposed free ends having parallel related walls extending in the direction of the longitudinal axis of said casing and being spaced a predetermined distance apart, said ring throughout its entire length extending radially outwardly of said flanges, said ring having an outer diameter which is slightly less than said inner diameter of said casing for solely insuring smooth reciprocating movement of said piston without defining any annular passage through which the fluid may pass between said opposite sides of said piston, at least one permanent open passage being located outwardly of said peripheral wall of said piston head through which fluid solely passes in permanent flow relation between said opposite ends of said piston to thereby control the dampening effect during reciprocation of said piston, said passage being delimited by said parallel walls, said outer diameters of said flanges, and said inner wall of said casing, and the space between said parallel walls varying with change in temperature of said ring to thereby solely change the size of said passage and to control the dampening effect.

---

**4,369,865**

## LOCK-UP CONTROL SYSTEM FOR A TORQUE CONVERTER

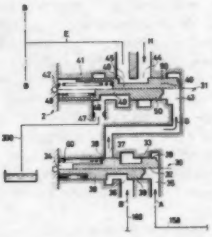
**Yoshio Sunohara, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Mar. 23, 1979, Ser. No. 23,471**

**Claims priority, application Japan, Apr. 4, 1978, 53/38851**

**Int. Cl.³ F16H 47/00**

**U.S. Cl. 192—3.31** **7 Claims**



1. In an automatic transmission for a vehicle, the automatic transmission having at least two forward gear ratios and including a torque converter with a lock-up mechanism including a lock-up chamber, a source of a first pressurized fluid, a passageway communicable with the source of the first pressurized fluid to be pressurized when a predetermined one of the two forward gear ratios is established, a source of a second pressurized fluid indicative of the vehicle speed, and a fluid reservoir;

a hydraulic control system for the torque converter comprising:

a first valve means communicating with the passageway and with the source of the second pressurized fluid;

a second valve means communicating with the lock-up chamber and having a first inlet port;

said first valve means being operable for establishing fluid communication between said first inlet port of said second valve means and one of

the passageway or

the source of the second pressurized fluid when a pressure in the other one of

the passageway or

the source of the second pressurized fluid is higher than a predetermined value;

said second valve means being operable for connecting the lock-up chamber to said fluid reservoir when said fluid communication is established and the pressure in said first inlet port of said second valve means is higher than a predetermined value;

whereby when the predetermined one of the two forward gear ratios is established and the vehicle speed is higher than a predetermined speed, the lock-up torque converter locks-up.

---

**4,369,866**

## VEHICLE TRANSMISSION SYSTEM

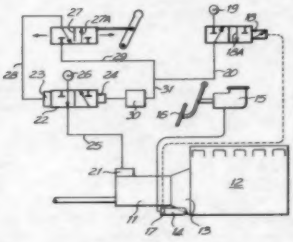
**Simon V. R. Bateson, Stoke-on-Trent, and Andrew Gerrard, Chorley, both of England, assignors to British Leyland UK Limited, London, England**

**Continuation of Ser. No. 3,394, Jan. 12, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,940**

**Claims priority, application United Kingdom, Jan. 12, 1978, 1189/78**

**Int. Cl.³ B60K *41/22***

**U.S. Cl. 192—3.57** **7 Claims**



1. A vehicle transmission comprising a clutch, a gear box having first and second ranges of gear ratios, first valve means connected to a source of compressed gas, said first valve means being actuable to a position to allow the passage of gas from said source, actuating means for moving said valve to said gas passage position in response to depressing said clutch, pressure actuated means for changing the range of gear ratios to one of said ratios in response to pressurization thereof, and for permitting changing to the other of said ratios in the absence of pressurization thereof, second valve means connected between a source of compressed gas and said pressure actuated means, said second valve means being actuable to a first position in which said source is connected to and continuously communicates with said pressure actuated means to change to and maintain said one gear ratio, and to a second position in which said source is disconnected from said pressure actuated means, actuator means responsive to the passage of gas from the first valve means for actuating said second valve to its first and second positions, and preselector control means for preselecting the range of gear ratios and comprising means for selecting the position to which said second valve is moved in response to passage of gas from said first valve means when said clutch is depressed.

---

**4,369,867**

## AUTOMATIC TRANSMISSION PARKING BRAKE MECHANISM

**George E. Lemieux, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 11, 1980, Ser. No. 186,048**

**Int. Cl.³ B60T *1/02*; B60K *41/26***

**U.S. Cl. 192—4 A** **3 Claims**

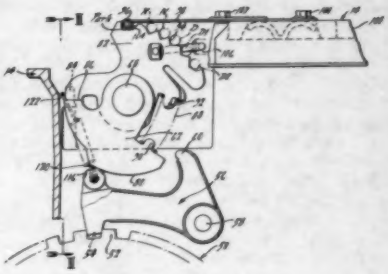
1. A transmission parking brake for anchoring a transmission power output shaft to a relatively stationary transmission housing comprising:

a parking gear carried by and rotatable with said power output shaft, said parking gear having external teeth;

a parking pawl lever mounted on said housing for oscillation about a first axis, said pawl lever having a pawl adapted to engage said teeth when said pawl lever is oscillated in one direction, means for moving said pawl lever in the opposite direction, said pawl lever having a cam follower thereon;

a detent plate mounted on a second axis spaced from said first axis;

a cam plate mounted on said second axis adjacent said detent plate, a support shaft for supporting said detent plate and said cam plate for oscillation about said second axis, said detent plate and said cam plate having engageable parts that are engaged, one with respect to the other;



a cam surface on said cam plate adapted to engage a follower portion of said pawl lever;

spring means engageable with said detent plate and said cam plate to urge them into mutual engagement;

means for adjusting said detent plate and said cam plate in said one direction whereby said cam surface forces said pawl into locking engagement with said gear; and

said means for moving said pawl lever in said opposite direction comprising a tail portion on said pawl lever, said cam plate being adapted to engage said tail portion when said cam plate is moved out of the gear locking position, said cam plate and said tail portion being located generally in a common plane of movement.

---

**4,369,868**

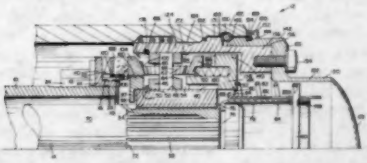
## AUTOMATIC CLUTCH FOR FOUR-WHEEL DRIVE VEHICLES

**Arthur M. Fleitas, Loveland, Colo., assignor to Dualmatic Manufacturing Company, Longmont, Colo.**

**Filed Aug. 25, 1980, Ser. No. 180,699**

**Int. Cl.³ F16D *13/04***

**U.S. Cl. 192—36** **10 Claims**



1. A selective drive clutch for automatically connecting a driven element to a drive element for conjoint coaxial rotation and for automatically disconnecting same when said drive element is not being driven, comprising: a first interlocking member mountable upon the driven member for rotational movement therewith; a second interlocking member mountable upon the drive element for rotational movement therewith

and for axial movement relative thereto between retracted and extended positions; means carried by opposed end portions of said first and second interlocking members effective upon extension of the latter to interengage and effect a driving connection therebetween; first biasing means operatively associated with said second interlocking member normally biasing same into retracted position; and actuating means responsive to limited relative rotational movement between said drive and driven elements for effecting an axial shift of said second interlocking member between its extended and retracted positions, said means including a pair of tooth-carrying elements mounted in axially-spaced face-to-face relation, said elements each having arcuately-curved rows of teeth arranged in opposed relation, the first of said pair of tooth-carrying elements being movable both axially and rotarially with said second interlocking member on the end thereof remote from said first interlocking member, the second of said pair of tooth-carrying elements being mounted for independent rotation relative to said first tooth-carrying member in coaxial relation thereto, one of said curved rows of teeth defining a track encircling the axis of rotation in perpendicular relation thereto, the other of said curved rows of teeth defining at least one concave cam surface having stops at the remote ends thereof and a pair of oppositely-inclined ramps arranged in end-to-end relation therebetween; said actuating means also including a cam follower subassembly located between said first and second tooth-carrying elements, said subassembly having a toothed roller operatively interconnecting the teeth of each cam surface with the teeth of the track opposite thereto so as to define a driving connection therebetween, and roller support means frictionally associated with at least one of said first and second interlocking members for rotational movement therewith when interlocked; and said actuating means further including braking means having a fixed friction surface engaging said second tooth-carrying element operative to yieldably retard rotation thereof, said actuating means being operative in reponse to relative rotation of said drive element in either direction relative to said driven element to overcome the bias exerted upon the second interlocking element by said first biasing means and cause said toothed roller to ascend one of the ramps thereby extending said second interlocking element into interlocked driving engagement with said first interlocking member while said second tooth-carrying element is being held against rotation by the braking means thereof, said actuating means also being operative upon continued rotation of said interlocked first and second interlocking members in the same direction to drive said toothed roller against the stop at the end of said ascended ramp thus preventing further relative rotational movement between said first and second tooth-carrying elements and causing the latter to overcome the frictional contact between it and the braking means thereby causing it to slip relative thereto, said actuating means being further operative in cooperation with said biasing means in response to reversal of said drive element with the first and second interlocking elements interlocked to cause said toothed roller to descend said ascended ramp and ascend the other thus momentarily retracting said second interlocking member before again extending and reconnecting same to said first interlocking member for continued driving engagement in said reverse direction, and said actuating means being still further operative in cooperation with said biasing means in response to deactivation of said drive element into a free-wheeling condition and rotation of said driven element relative thereto in a direction opposite to that in which said drive element was last driven while said braking means remains effective to prevent rotation of said second tooth-carrying means to rotate said interlocked first and second interlocking elements as a unit relative to said cam follower subassembly so as to cause the toothed roller thereof to descend the ramp it has ascended thereby allowing said biasing means to bias said second interlocking member into retracted position and releasing the driving connection between it and said first interlocking member.

**4,369,869**

## SAFETY DEVICE FOR MECHANICAL OR HYDRAULIC PRESSES

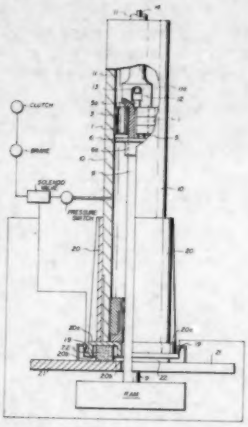
**Anna M. Sannipoli, Gubbio; Lordana Nibi, Fabriano, and Giorgio Saldi, Gubbio, all of Italy, assignors to Sicurpress Antinfortunistica & C., Gubbio, Italy**

**Filed Sep. 17, 1980, Ser. No. 188,105**

**Claims priority, application Italy, Oct. 17, 1979, 631 A/79**

**Int. Cl.³ F16P *3/18*; F16D *67/02*; F16F *9/34***

**U.S. Cl. 192—131 R** **6 Claims**



1. A safety device for a ram for preventing unwanted travel of the ram in a press or the like which includes:

the ram,

a rod (9) operatively connected thereto and a dual hand control requiring two hands to energize and displace the ram and the rod;

the improvement comprising:

a piston fixed to the rod intermediately thereby defining upper (11) and lower (9) rod portions,

the ram connected to the lower rod portion,

a cylinder within which said piston is moveable,

fluid in said cylinder,

passage holes in said piston to allow migration of fluid when said piston moves with the rod,

a plunger disc (6) slidably supported on said lower rod having studs (5) extending through and depending from said piston by enlarged heads (5a) on a top portion of said studs resting on a top piston face,

said plunger disc having a bearing surface adapted to occlude said piston passage holes and means to keep said bearing surface of said plunger disc away from said piston and operated by and when the dual hand control is activated to allow fluid to pass through said piston and therefore said piston to move.

---

**4,369,870**

## AUTOMATIC GRAIN DISTRIBUTOR

**Edmund P. Taylor, Greencastle, Ind., assignor to Bryant-Poff, Inc., Coatesville, Ind.**

**Filed Sep. 11, 1980, Ser. No. 186,350**

**Int. Cl.³ B65G *11/12***

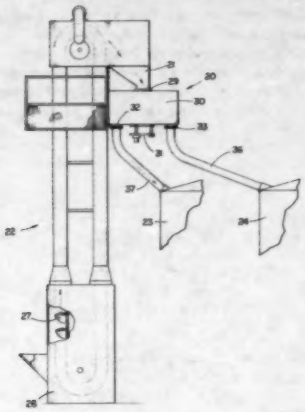
**U.S. Cl. 193—23** **12 Claims**

1. An automatic distributor suitably arranged for interfacing between a material source location and a plurality of remote delivery locations, said automatic distributor comprising:

a distributor housing including a material inlet and a bottom plate, the bottom plate including a plurality of delivery apertures suitably arranged for connection to remote delivery locations;

an inner spout disposed within said distributor housing and coupled at one end to said material inlet, the opposite end being selectively positionable into flow communication with one of said delivery apertures; and

means for moving said inner spout from a position of direct



flow communication with one of said plurality of delivery apertures to a position of direct flow communication with a different one of said plurality of delivery apertures, said moving means including an eccentric plate suitably arranged to initiate movement of said inner spout from one delivery aperture to said different delivery aperture.

---

**4,369,871**

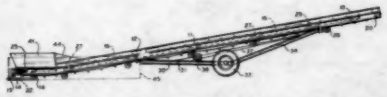
## ELEVATOR CONVEYOR FOR TOMATOES OR THE LIKE

**Harold B. Patten, 4631 Bay's Rd., Rising Sun, Ohio 43457, and Samuel H. Patten, 10721 McCutchionville Pike, Wayne, Ohio 43466**

**Continuation of Ser. No. 46,093, Jun. 6, 1979, abandoned. This application Jan. 21, 1981, Ser. No. 226,909**

**Int. Cl.³ B65G *41/00***

**U.S. Cl. 198—320** **3 Claims**



1. Elevator conveyor for tomatoes and the like comprising:

a. an upwardly inclined main frame having an upper end and a lower end, said main frame including two spaced apart parallel beams connected by a series of spaced apart transverse braces, a plurality of inwardly-extending block means connected to said beams, a series of first rollers rotatably secured to said beams, one of said first rollers being disposed between adjacent ends of said block means, and a series of second rollers secured to an underside of said main frame,

b. a dog leg lower end frame portion integral with said lower end of said main frame and disposed substantially parallel to the supporting surface,

c. an endless rubber covered chain conveyor operating throughout said dog leg and main frame, an upper flight of said conveyor chain being carried by said block means and said first rollers and a lower flight of said conveyor chain being carried by said second rollers, said chain conveyor including spaced apart transversely extending cross pieces and upstanding pusher paddles,

d. a subframe connected to the underside of said main frame having articulated arms and a wheel support axle,

e. sheave and cable means connected to said articulated arms to cause upon operation variation in vertical positioning of the upper end of said main frame, and

f. a reel means for operating said cable means.

---

**4,369,872**

## APPARATUS FOR THE MANUFACTURE AND/OR HANDLING OF WORKPIECES

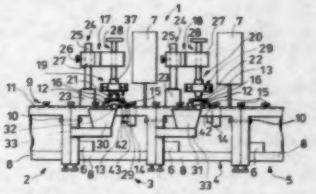
**Walter Sticht, Wankhamerstrasse 8/48, Attnang-Puchheim, Austria (A-4800)**

**Filed Sep. 12, 1980, Ser. No. 186,655**

**Claims priority, application Austria, Oct. 31, 1979, 7023/79**

**Int. Cl.³ B65G *47/04***

**U.S. Cl. 198—339** **26 Claims**



1. An apparatus for the manufacture or the handling of workpieces, which comprises

(a) a succession of work stations,

(b) conveyor means interconnecting the work stations and arranged for transporting respective ones of the workpieces from, to and between the work stations,

(c) elongated guide means for the conveyor means,

(d) a mechanism associated with each one of the work stations for handling a respective one of the workpieces, the mechanism including

(1) a fixed support,

(2) three rectilinear guide tracks extending perpendicularly to each other, a first one of the guide tracks extending in a plane perpendicular to the plane defined by the elongated guide means and being affixed to the fixed support, and two additional guide tracks extending in a plane parallel to the plane defined by the elongated guide means, one of the additional guide tracks extending parallel to the elongated guide means and the other one of the additional guide tracks extending perpendicularly thereto,

(3) a holder slidably mounted on the first guide track and one of the additional guide tracks being affixed to the holder,

(4) a carrier element slidably mounted on the additional guide track affixed to the holder and another one of the additional guide tracks being affixed to the carrier element,

(5) a gripping element slidably mounted on the additional guide track affixed to the carrier element and capable of gripping the respective workpiece, and

(6) drive means associated with the guide tracks for moving the respective workpiece gripped by the gripping element along respective ones of the guide tracks, and

(e) a control for operating the drive means in dependence on each other.

## 4,369,873
## APPARATUS FOR LATERALLY DEFLECTING ARTICLES

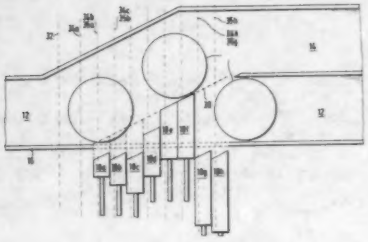
**Bernhard Heuft, Im Sonnenwinkel 14, 5475 Burgbrohl, Fed. Rep. of Germany**

**Filed Jan. 10, 1979, Ser. No. 2,261**

**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801387**

**Int. Cl.³ B65G** *37/00, 47/10, 47/26*

**U.S. Cl. 198—/367** **8 Claims**



1. An apparatus for laterally deflecting specific articles selected with respect to one criterion from a first conveyor means to a second conveyor means for the deflected articles, said apparatus comprising:

(a) deflecting segments each having an oblique working face, said segments being

(i) stationary in the direction of advance of said articles to be deflected;

(ii) extensible and retractable in such a manner that the working faces of individual segments are flush with the working faces of the preceding segments and together form a deflecting surface leading from said first conveyor means to said second conveyor means; and

(iii) the width of each segment being less than about one-half of the sum of the dimension of the articles in the direction of advance and their distances from each other;

(b) operating means which operate on the individual segments to extend and retract them;

(c) detecting means which generate control signals each time an article passes the same; and

(d) delay means which delay the control signals in response to the velocity of said conveyor means, the distance between said detecting means and each of said individual deflecting segments, and the reaction time and the extending and retracting time of said segments, whereby at any given point in time only those segments are extended or will be extended which at this point in time or immediately thereafter are necessary for deflecting an article, and whereby said segments do not move at the time an article which is to be deflected is contacting said segments.

---

## 4,369,874
## DEVICE FOR DISENTANGLING ENTANGLED COMPONENTS

**Hans Kettner, cFranzburger Strasse 14a, 3007 Gehrden, and Odo Hütter, Mendelssohnstrasse 50, 3000 Hannover, both of Fed. Rep. of Germany**

**PCT No. PCT/DE79/00056, § 371 Date Feb. 13, 1980, § 102(e) Date Feb. 12, 1980, PCT Pub. No. WO80/00074, PCT Pub. Date Jan. 24, 1980**

**PCT Filed Jun. 13, 1979, Ser. No. 191,340**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2826245; Nov. 28, 1978, 2851811**

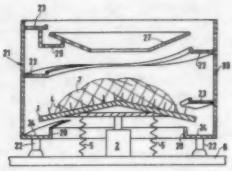
**Int. Cl.³ B65G** *47/14, 47/24*

**U.S. Cl. 198—396** **10 Claims**

1. A device for disentangling components from a cluster of entangled components including a disentangling plate, and vibrator means coupled to drive said plate and formed to impart reciprocal movement to said plate, wherein the improvement in said device comprises:

said plate being an imperforate, continuous plate formed for support of a bottom side of said cluster of components directly in contact with said plate during reciprocal movement thereof;

a plurality of pins extending vertically from an upwardly facing side of said plate for support of said cluster of entangled components against movement in a horizontally extending direction, said pins being relatively spaced apart at a distance permitting support of said bottom side of said cluster directly on said plate and permitting movement of



disentangled components in a horizontally extending direction along said plate;

guideway means formed for guided vertical reciprocation of said plate;

said vibrator means being formed for vertical reciprocal movement of said plate to produce alternate vertical lifting and impacting of said cluster against said plate; and

said vibrator means being further formed to enable controlled change of the amplitude and frequency of said vertical reciprocal movement to change the rate and magnitude of lifting and impacting of said cluster against said plate.

---

## 4,369,875
## APPARATUS FOR ISOLATION AND SUPPLY OF OBJECTS, IN PARTICULAR SWEETS, TO A PACKING MACHINE

**Heinz Schmitz, Hurth-Efferen, Fed. Rep. of Germany, assignor to Firma Rose Verpackungsmaschinen-Fabrik Theegarten GmbH & Co. KG, Cologne, Fed. Rep. of Germany**

**Filed Jul. 29, 1980, Ser. No. 173,276**

**Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932431**

**Int. Cl.³ B65G** *47/26, 47/31*

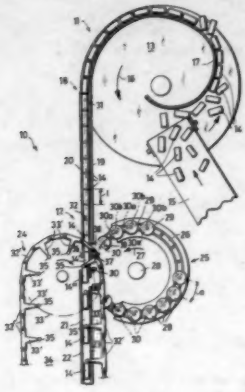
**U.S. Cl. 198—456** **9 Claims**

1. An apparatus for feeding and isolating generally rectangular objects moving at a relatively high speed, said apparatus comprising;

first conveyor means for advancing said objects in side by side relation at a predetermined first velocity along a first path;

an endless flexible element located above said first conveyor means and moving at a second predetermined velocity greater than said first velocity along a second path, said path having at least an arcuate portion crossing over said first path, and a continuous generally straight portion exiting said arcuate portion and generally parallel to said first path, said flexible element including means laterally offset from said flexible element and projecting radially inwardly from said element when said element moves along said arcuate portion, said means including downwardly extending dog members having a component of velocity parallel to said first path which increases as said dog members approach said straight portion and is approximately equal to said first velocity at a predetermined location along said arcuate position, said first and second generally straight paths being spaced and generally parallel and situated in the same horizontal plane, and

means at said predetermined location for laterally shifting said objects one at a time from said first straight path to



said second straight path, exposing a portion of the trailing surface of said shifted objects to said dog members.

---

**4,369,876**

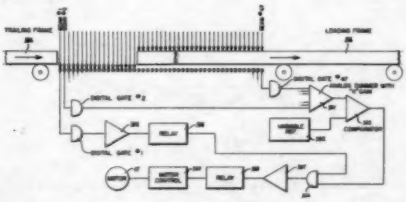
## MULTI-LAYER COATING APPARATUS, SYSTEM AND METHOD

**Edward A. Small; Richard H. Edwards; Eugene A. Eufusia; Robert M. Clary, and Nils H. Bergfelt, all of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.**

**Continuation of Ser. No. 848,935, Nov. 7, 1977, which is a division of Ser. No. 756,482, Jan. 3, 1977, abandoned, which is a division of Ser. No. 574,300, May 5, 1975, Pat. No. 4,015,558, which is a continuation of Ser. No. 311,783, Dec. 4, 1972, abandoned, which is a continuation of Ser. No. 8,813, Feb. 5, 1970, abandoned. This application Nov. 13, 1980, Ser. No. 206,369**

**Int. Cl.³ B65G *47/26***

**U.S. Cl. 198—460** **4 Claims**



1. In a conveyor system for controlling the spacing between fragile articles being conveyed, a framework, first, second and third conveyors mounted end to end on said framework for advancing articles along a path, said first conveyor having means for causing it to operate at one rate of travel, said second conveyor having means for causing it to operate at said one rate of travel and at a second rate of travel, said third conveyor having means for causing the same to operate at said second rate of travel, and electronic means associated with the second conveyor means for sensing the spacing between the trailing edge of a preceding article and the leading edge of a following article and connected to the second conveyor for causing the second conveyor to operate at said first rate of speed until the following article approaches said preceding article to provide a predetermined spacing between the following and preceding articles to prevent them from bumping into each other and thereafter causing the second conveyor to travel at said second rate of speed said electronic means including means for adjusting said predetermined spacing in accordance with the type of article being conveyed.

---

**4,369,877**

## STOCKPILE RECLAIMING APPARATUS

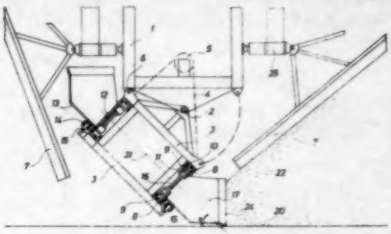
**Helmut Heuer, Bad Oeynhausen, Wilhelm Schäpsmeier, Porta Westfalica; Hans D. Fohlmeister, Bad Oeynhausen, all of Fed. Rep. of Germany, assignors to Weserhütte Aktiengesellschaft, Bad Oeynhausen, Fed. Rep. of Germany**

**Filed Mar. 3, 1980, Ser. No. 126,577**

**Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907966**

**Int. Cl.³ B65G *65/06***

**U.S. Cl. 198—509** **6 Claims**



1. A stockpile reclaiming apparatus for discharging bulk material from a stockpile having a predetermined bed; said apparatus comprising

a bridge extending over the width of the stockpile for displacement longitudinally of the stockpile;

a support framework mounted on and under said bridge; and

a discharging means mounted on said framework, said means including an endless traction means journalled in said framework in parallel to an end face of the stockpile and a plurality of discharge elements fastened to said endless traction means for movement in an endless path parallel to and laterally across the width of the end face of the stockpile to pick up material directly therefrom and to discharge the material at the base of the stockpile, each said discharge element including a rear wall, a bottom and a pivotal side wall, each said side wall abutting a bottom of a following discharge element wherein in a longitudinal run of said traction means, said side wall of one discharging element forms a second side wall of an adjacent discharging element, said endless path being disposed in a plane inclined to the bed of the stockpile, said plane defining an acute angle with the plane of the bed with an apex of said angle directed toward the end face of the stockpile.

---

**4,369,878**

## CONVEYOR BELT TRACKING

**Eugenio Millevoi, Fort Lee, N.J., assignor to Weldotron Corporation, Piscataway, N.J.**

**Filed Nov. 4, 1980, Ser. No. 203,894**

**Int. Cl.³ B65G *39/16***

**U.S. Cl. 198—807** **3 Claims**

1. Conveyor belt tracking apparatus comprising

a horizontal conveyor belt and means to drive it in a longitudinal direction along a desired straight path,

said belt having left and right edges,

a drive motor disposed beneath said conveyor belt and having left and right universal joints,

a generally horizontal first threaded shaft secured to said right universal joint and a generally horizontal second threaded shaft secured to said left universal joint,

a first pivot block having one, lower, end coupled to said

first threaded shaft and adapted to move back and forth along said first threaded shaft,

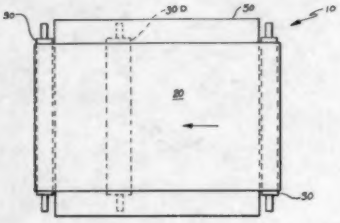
a second pivot block having one, lower, end coupled to said second threaded shaft and adapted to move back and forth along said second threaded shaft,

a first guide roller horizontally disposed beneath the conveyor belt adjacent to the right edge of the conveyor belt,

said first pivot block having its other, upper, end secured to said first guide roller, the coupling being such that movement of the lower end of the pivot block causes pivoting of the upper end of the pivot block and of the first roller secured thereto,

a second guide roller horizontally disposed beneath the conveyor belt adjacent to the left edge of the conveyor belt,

said second pivot block having its other, upper, end secured to said second guide roller, the coupling being such that movement of the lower end of the pivot block causes




pivoting of the upper end of the pivot block and of the second roller secured thereto,

a right switch disposed adjacent to the right edge of said conveyor belt and adapted to be contacted by said conveyor belt if said conveyor belt moves to the right as it proceeds in said direction, and

a left switch disposed adjacent to the left edge of said conveyor belt and adapted to be operated by said conveyor belt if said conveyor belt moves to the left as it proceeds in said direction,

said right and left switches being connected to said motor and adapted, when closed by said belt, to rotate said first and second threaded shafts in such directions as to cause said first and second pivot blocks to move along their shafts and pivot said first and second rollers in such a direction that one roller contacts the belt and applies a force which moves it back to its normal desired path of travel.

---

**4,369,879**

## MAGNETIC DISK STORAGE CASE

**Robert A. Egly, 1630 Marguerite Dr., Corona del Mar, Calif. 92625, and Patrick Sullivan, Tustin, Calif., assignors to Robert A. Egly, Corona del Mar, Calif.**

**Filed Jan. 21, 1981, Ser. No. 226,621**

**Int. Cl.³ B65D** *85/57, 1/24*

**U.S. Cl. 206—45.18** **25 Claims**

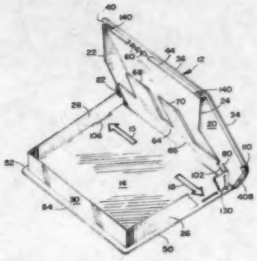
1. A container for magnetic storage material such as disks, magnetic cards and the like comprising:

a clamshell-like opening and closing container having a bottom portion which generally provides a base and a receptacle for a top portion of said clamshell container which has been hinged thereto and which has a ledge within said top portion of said container for receipt of magnetic memory storage members between the ledge and the inner surface of said container;

means for resiliently hinging said bottom and top member formed from a continuous hinge member between said top and bottom member;

means for holding said top member open in a resting mode on said bottom member for exposure and access of magnetic storage members resting on said ledge between said top member and said ledge comprising a protuberance which can engage the bottom portion with respect to said top member;

resilient side walls at least partially surrounding said bottom portion into which said top portion is received of suffi-




cient resilience to allow said protuberance to override its engagement by flexing laterally to permit such disengagement; and,

lateral walls on either side of said top portion in proximate relationship to said ledge for capturing magnetic memory members between said lateral walls, said ledge and said inner surface of said top member.

---

**4,369,880**

## POP-UP ARMED SUTURE

**Robert W. Giggey, Port Washington; Bernard T. Serletic, Manhasset, both of N.Y., and Charles R. Ashley, Clinton, N.J., assignors to Howmedica, Inc., New York, N.Y.**

**Filed Mar. 6, 1981, Ser. No. 241,094**

**Int. Cl.³ A61B** *17/04;* **B65D** *85/24*

**U.S. Cl. 206—63.3** **42 Claims**

1. A container for dispensing at least one suture secured to one end of a needle, comprising:

a. first panel means for retaining a portion of the needle, said first panel means capable of flexing about a first predetermined axis such that the remaining portion of the needle is exposed free of said first panel means upon flexing of said first panel means about said first predetermined axis;

b. second panel means for retaining a major portion of the suture, said second panel means being connected to said first panel means and configured such that the suture can be withdrawn therefrom upon removal of the needle from said first panel means; and

c. third panel means connected to said second panel means and coupled to said first panel means, said third panel means capable of being displaced so as to effect flexing of said first panel means about said first predetermined axis, so as to expose said remaining portion of the needle free of said first panel means.

**4,369,881**

## COIL PACKAGE WITH HUB FORMING MEANS CONTAINED THEREIN

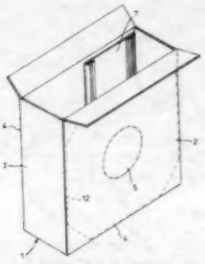
**Neville J. Ditchfield, 19 Gleneagles Close, Vicars Cross, Cheshire, England**

**Filed Nov. 16, 1981, Ser. No. 321,812**

**Claims priority, application United Kingdom, Nov. 14, 1980, 8036601**

**Int. Cl.³ B65D *85/04*; B65H *55/02***

**U.S. Cl. 206—225** **15 Claims**



1. A coil package comprising a closed carton which is formed from at least one folded blank of cardboard or plastics material and which has a pair of oppositely disposed major side walls whose boundary edges lie in substantially parallel planes, each of which major side walls has an area of weakness in axial alignment with an area of weakness in the other major side wall; a coil of wire housed in the closed carton; and, removably housed in the closed carton, separately formed means for forming a substantially rigid hollow hub, the arrangement being such that, when it is desired to convert the closed carton into a reel to facilitate withdrawal of wire from the package, the areas of weakness are removed from the major side walls to form apertures therein, the separately formed hub-forming means is extracted from the package, and the hub-forming means is assembled to form a substantially rigid hollow hub extending between and secured to parts of the major side walls bounding the apertures in the major side walls.

---

**4,369,882**

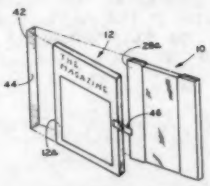
## CONTAINER FOR PRODUCT SAMPLES

**Allen Schluger, New York, N.Y., assignor to Modular Magazine Sampling Systems, Inc., New York, N.Y.**

**Filed Jun. 19, 1981, Ser. No. 275,372**

**Int. Cl.³ B65D *77/00, 77/26, 85/00***

**U.S. Cl. 206—232** **5 Claims**




1. A flexuring container for fragile product samples comprised of a paperboard blank delineated into a similarly sized rectangularly shaped back panel and a pair of opposite side panels, a pair of spacing panels each of an elongated rectangular shape and of a selected width interconnecting each said side panel along an edge of said back panel, a body of plastic foam construction material with selected portions removed to form product sample-receiving compartments having an operative position adhesively secured to said back panel, said height of said plastic body being of the same extent as the width of said spacing panels and said shape and size thereof being of the same extent as said back panel, a clear plastic sheet disposed in covering relation over said plastic body to serve as a closure for said compartments therein, and a strip formed into a closed loop disposed in encircling relation over the operative positions of said side panels closed upon said plastic body, said closed loop having an operative position oriented transversely and centrally of said closed side panels, whereby limited slippage is permitted in said side panels under said closed loop which continues to maintain said side panels closed upon said plastic body while allowing corresponding limited flexuring in said container to the extent of said slippage.

---

**4,369,883**

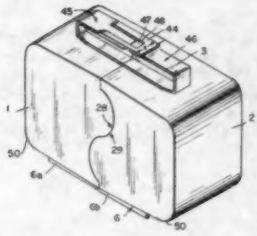
## TAPE CASSETTE STORAGE AND CARRYING CASE

**David M. Stravitz, 16 Park Ave., (Suite 14A), New York, N.Y. 10016**

**Filed Apr. 27, 1981, Ser. No. 258,007**

**Int. Cl.³ B65D *85/67***

**U.S. Cl. 206—387** **10 Claims**




1. A tape cassette storage and carrying case, comprising:

first and second substantially hollow shell members (1,2) each having an open end and a bottom opposite said open end, said shell members being pivotally connected together and being relatively movable between a closed position wherein said open ends face each other, and an open position wherein sides of said shells are adjacent each other;

support means (21,22) mounted at the inner, bottom ends of said shell members and defining a plurality of stepped support levels for cassettes inserted in the shells from the open ends of said shells, the support levels for each cassette being different and being stepwise graduated in an ascending manner from the front toward the back of the shell members, the stepped support levels of the shell members (1, 2) ascending in opposite directions; and

means for maintaining said shells in said closed position to enclose cassettes stored therein.

---

**4,369,884**

## INK RIBBON CARTRIDGE PACK

**James R. Daughters, 244 Morris Ranch Rd., Danville, Calif. 94526**

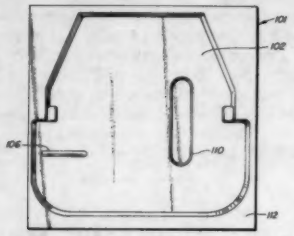
**Continuation-in-part of Ser. No. 80,880, Oct. 1, 1979, Pat. No. 4,307,969. This application Jul. 20, 1981, Ser. No. 284,430**

**Int. Cl.³ B65D *85/67, 1/40*; B41J *35/28***

**U.S. Cl. 206—389** **8 Claims**

1. A protective pack for packing a plurality of ribbon cartridges inside a carton, each of said cartridges including a body, a ribbon pancake mounted within the body, said body having a viewport extending radially adjacent the ribbon pancake to allow observation thereof, the protective pack comprising a shell defining a cavity having a shape substantially conforming to that of the cartridge and a shoulder projecting

from the shell into the cavity, the shoulder having dimensions and being located so that it will project through the viewport



and engage the ribbon pancake when the cartridge is placed in the pack.

---

**4,369,885**

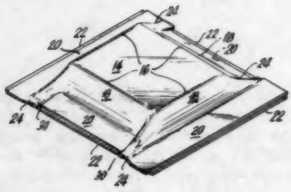
**SEALED PACKAGES FOR SPREADABLE PRODUCTS**

**Sanford Redmond, 1385 York Ave., New York, N.Y. 10021**

**Division of Ser. No. 180,062, Aug. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 80,141, Sep. 28, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 222,979**

**Int. Cl.³ B65D** *65/32, 65/02, 85/74*

**U.S. Cl. 206—484** **19 Claims**



1. A sealed package for storing, shipping and handling an individual service portion of a spreadable product and for supporting said spreadable product for use after opening said package, comprising:

(a) a substantially flat, relatively stiff, base member;

(b) a spreadable product removably adhered to and supported by the top surface of said base member;

(c) margins on said base member surrounding said spreadable product;

(d) a relatively thin, flexible cover member having

(i) a center portion spaced from said base member and covering said spreadable product,

(ii) downwardly extending side walls about the periphery of said center portion, and

(iii) outwardly extending margin portions at the ends of said downwardly extending side walls and surrounding said center portion;

(e) means for removably sealably adhering said outwardly extending margin portions of said cover member to said margins on said base member to sealingly enclose said spreadable product therebetween for said storing, shipping and handling thereof; and

(f) opening means permitting a portion of said cover member to be grasped for peeling said cover member from both said base member and said spreadable product so that said spreadable product remains adhered to and supported by said base member for use upon removal of said cover member.

**4,369,886**

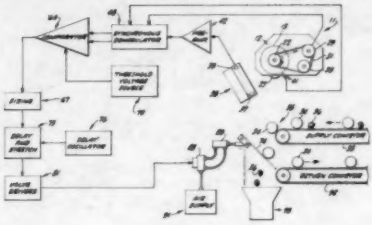
**REFLECTANCE RATIO SORTING APPARATUS**

**Marvin M. Lane, and Eric W. D. Garnett, both of Woodland, Calif., assignors to Ag-Electron, Inc., West Sacramento, Calif.**

**Continuation of Ser. No. 82,961, Oct. 9, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 301,583**

**Int. Cl.³ B07C** *5/342*

**U.S. Cl. 209—564** **20 Claims**



1. An apparatus for sorting two materials, each material exhibiting an amplitude peak in reflected light wave energy at a different characteristic frequency, comprising:

a. illumination means for exposing a planar area defining a sampling zone to a sampling cycle, said sampling cycle including alternating pulses of light wave energy at two distinct frequencies, each of said pulses corresponding in frequency, respectively, to the characteristic frequency of amplitude peak in reflected light energy for each of the materials;

b. means for moving the materials through the sampling zone;

c. a single detector directed at the sampling zone and adapted to produce an electrical signal commensurate in amplitude to the intensity of light reflected from the materials moving through the sampling zone;

d. comparator means for producing a reject signal if the amplitude of a first electrical signal corresponding to the first of said pulses and the amplitude of a second electrical signal corresponding to the second of said pulses, bear a predetermined relationship; and,

e. means for physically separating one of the materials from the other material in response to the reject signal.

---

**4,369,887**

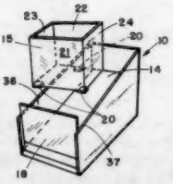
**MERCHANDIZING RACK**

**Merton D. Emery, Grand Haven, Mich., assignor to Harbor Industries, Inc., Grand Haven, Mich.**

**Filed Oct. 11, 1979, Ser. No. 83,802**

**Int. Cl.³ A47F** *3/14*

**U.S. Cl. 211—49 D** **34 Claims**



1. A merchandising rack for displaying and dispensing a plurality of generally planar upright product packages comprising:

a forwardly inclined ramp adapted for receiving a first linear

array of the product, said ramp comprising a hard planar surface;

a product carrying container slidably engaging said ramp, said container being adapted for receiving a second linear array of the product and backing up the first linear array of the product to gravity bias the first linear array of the product forward for viewing and dispensing of the product, said container being provided with an array of anti-friction means comprising an array of Teflon pads; and

stop means disposed at the front of said ramp for engaging the first linear array of the product and said container when the first linear array of the product is exhausted.

---

**4,369,888**

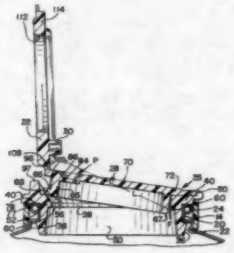
**CLOSURE FOR CONTAINER**

**John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.**

**Filed Mar. 11, 1981, Ser. No. 242,756**

**Int. Cl.³ B65D *39/04***

**U.S. Cl. 215—237** **10 Claims**



1. A flexible plastic closure for a container comprising a neck sleeve adapted to fit into an opening in a container, said neck sleeve having a bore providing a pour aperture, plug locking means on said neck sleeve extending radially into the bore, a plug insertable into said pour aperture for closing the container, said plug having locking means for interlocking engagement with said plug locking means on said neck sleeve upon full insertion of said plug into said neck sleeve, said locking means on said neck sleeve including means for guiding said plug in canted relation into said bore with a portion of said locking means on said plug entering into engagement with said plug locking means on said neck sleeve for operation as a fulcrum at one side of said plug whereby upon the application of an inwardly directed force on said plug at a point diametrically opposite said fulcrum said plug serves as a lever against said neck sleeve and swings about said fulcrum to facilitate full insertion of said plug into said bore and thereupon interlock both of said interlocking means with each other.

---

**4,369,889**

**TAMPERPROOF CLOSURE**

**Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Richmond, Va.**

**Filed Jun. 8, 1981, Ser. No. 271,775**

**Int. Cl.³ B65D *41/34***

**U.S. Cl. 215—246** **7 Claims**

1. A thermoplastic closure for fitment into a container, said closure having:

(a) a top wall;

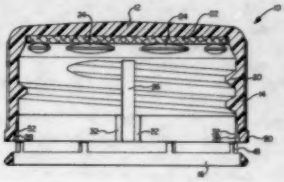
(b) an annular sidewall, downwardly depending from said top wall;

(c) a closure thread about the inside surface of said sidewall;

(d) sealing means above said closure thread for achievement of a gas-tight seal with said container;

(e) gas venting means for venting gas from said container to the atmosphere subsequent to loss of said gas-tight seal when said closure is loosened from its fitment to said container;

(f) heat-shrinkable tamper-indicating means attached to the lowermost end of said closure sidewall; and



(g) heat sink means adjacent the lowermost end of said sidewall, said heat sink means being an annular bead extending outwardly from the outer lowermost surface of said sidewall.

---

**4,369,890**

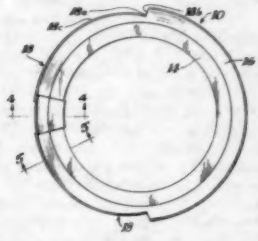
**PAINT CAN COLLAR**

**Gordon C. Bennett, 500 Isle of Capri, Fort Lauderdale, Fla. 33301**

**Filed Sep. 24, 1980, Ser. No. 190,345**

**Int. Cl.³ B65D *25/00, 25/48***

**U.S. Cl. 220—85 R** **3 Claims**



1. In a paint can collar of a type mountable on paint cans at their openings for preventing the dripping of paint and the filling of paint-can lid grooves, and of a type comprising a substantially annularly-shaped variable diameter body, said annularly-shaped body having a lower-lip portion with a greater diameter than said paint-can openings for being compressed and inserted into said openings and then expanding outwardly into engagement with inner walls of paint cans and an intermediate lip for extending over said paint-can lid grooves when said paint can collar is mounted on said paint cans, said annularly-shaped body being split at one place about its circumference to define two ends and adjacent end portions, said annularly-shaped body being constructed of resilient material which, when said annularly-shaped body is compressed, biases said annularly-shaped body to expand, with said end portions moving relative to one another and said lower-lip portion being urged outwardly into engagement with paint can walls, the improvement wherein:

said body has an upper lip portion outwardly projecting from said intermediate portion beyond the outer diameters of the paint cans, said upper lip portion defining a pair of radially-directed indentations for being placed into alignment with paint-can handles when they are placed in upright positions for lifting paint cans on which the collar is mounted, both of said indentations each having a substantially abrupt abutment corner at the intersection of an abutting edge and a gradually-tapering edge of the upper lip, the respective abutting edges extending substantially radially from said intermediate portion and being lateral to

and defining substantially straight, diametrically opposed, ends of a first arcuate portion of said upper lip portion, the respective gradually-tapering edges each extending from a second arcuate portion opposite said first arcuate portion, said second arcuate portion tapering gradually radially inwardly from a location distal from each of said abutting edges and ending at respective abrupt abutment corners, said gradually tapering edges allowing a handle to be easily moved into each of said indentations, while said abutting edges inhibit further movement of said handle beyond said indentations.

2. In a paint can collar of a type mountable on paint cans at their openings for preventing the dripping of paint and the filling of paint-can lid grooves, and of a type comprising a substantially annularly-shaped variable diameter body, said annularly-shaped body having a lower-lip with a greater diameter than said paint can openings for being compressed and inserted into said openings and then expanding outwardly into engagement with inner walls of the paint cans and an intermediate lip for extending over said paint-can lid grooves when said paint can collar is mounted on said paint cans, said annularly-shaped body being split at one place about its circumference to define two ends and adjacent end portions, said annular body being constructed of resilient material which, when said end portions are overlapped to reduce the diameter of said annularly-shaped body, biases said annularly-shaped body to expand with said end portions sliding relative to one another and said lower-lip being urged outwardly into engagement with paint can walls, the improvement wherein:

the main portion of said lower lip and said intermediate portion being configured to form a circular shape, but a first end portion of said lower lip on one side of said slit being radially inwardly, offset from a second end portion of said lower lip on the other side of said slit so that as the two lower-lip end portions slide along one another when overlapped, the first offset end portion allows the second end portion to be in lateral circular registration with the remainder of said lower lip except for the offset lower lip end portion and wherein a first intermediate lip end portion, corresponding to said first end portion of said lower lip, is upwardly offset from a second end portion of said intermediate lip on the other side of said slit so that as the two intermediate-lip end portions slide along one another when overlapped, circular registration of said intermediate lip except for the offset intermediate-lip end portion is allowed.

---

**4,369,891**

## STRUCTURE OF A BREATHER PIPE FOR GASOLINE TANKS

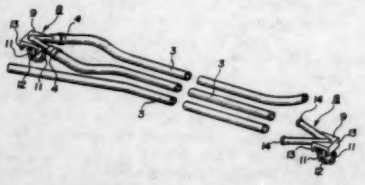
**Nobuya Shinozaki, Mooka, Japan, assignor to Kato Hatsujo Kaisha, Ltd., Yokohama, Japan**

**Filed Apr. 30, 1981, Ser. No. 259,057**

**Claims priority, application Japan, Aug. 30, 1980, 55-123216[U]**

**Int. Cl.³ B65D *90/28***

**U.S. Cl. 220—85 VR** **3 Claims**



1. In a structure of a breather pipe for a gasoline tank comprising connecting members constituting bending portions of said breather pipe and synthetic resin pipes constituting straight portions of said breather pipe which are successively connected to each other to be held in a zigzagged state and disposed above said gasoline tank, the improved structure characterized by said connecting members each molded of a synthetic resin and each comprising a base, a pair of internally communicating connecting arms disposed on the upper surface of said base for being inserted into said synthetic resin pipes, and a zigzag arrangement keeping leg extended downwardly from the lower surface of said base and provided with a pair of projecting pawls upwardly projecting outwardly from the lower end of said leg and having stepped portions formed on the leading ends thereof for coming into fast engagement with the edge of a hole bored in advance in a given panel.

---

**4,369,892**

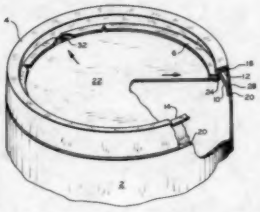
## CONTAINER WITH EXPANSION TYPE LOCKING CLOSURE

**Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed May 2, 1977, Ser. No. 792,757**

**Int. Cl.³ B65D *45/32***

**U.S. Cl. 220—320** **6 Claims**



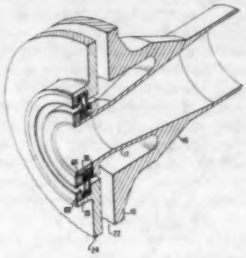
1. In combination, (1) a container made of flexible, resilient material having a circular top opening, a finish portion extending upwardly and inwardly from the body of the container in the form of the frustum of a cone which terminates at the top in an integral, outwardly extending, annular flange having a top surface upwardly and forming a circular container lip, and wherein the confluence of said frustum and said lip defines said opening (2) a lid made of flexible, resilient material having a central circular closing portion conforming generally to said circular top opening but smaller in diameter than said opening and an elevated, inverted generally U-shaped circular rim having (i) an interior surface opposing said upwardly facing surface of said circular container lip and conforming in shape to said surface of said circular lip but being slightly wider (ii) an outer annular peripheral skirt having an outer wall and an inner wall (iii) an inner annular skirt having an outer wall and an inner wall, wherein the bottom periphery of the inner wall of said outer skirt is slightly larger in diameter than the diameter of the outwardly facing outer periphery of said circular lip and (3) an expanding pressure ring which is circular when in operative, extended position and is below the plane of said circular top opening, said pressure ring when in operative position pressing radially outwardly against the bottom portion of said outer wall of the inner annular skirt of said lid, thus (a) extending the diameter of the bottom portion of said inner skirt, so that the outer diameter of the lid in the plane of the ring is larger than the diameter of the top of said frustum, and thus locking the lid and (b) pulling said outer skirt into firm contact with the outwardly facing outer periphery of said circular lip, and pulling said opposing interior surface into contact with the upwardly facing surface, of said lip, thereby forming a seal with said container finish.

**4,369,893**

## SEALING ARRANGEMENT WITH ANNULAR FLEXIBLE DISC

**William E. Pennell, Greensburg, and Charles A. Honigsberg, Monroeville, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 19, 1981, Ser. No. 235,371**
**Int. Cl.³ F16J 15/06**
**U.S. Cl. 220—378** **5 Claims**



1. An arrangement for creating a fluid seal between a first component having a portion through which a fluid flows, and a second component radially surrounding said first component and said portion so as to form an annulus between said components, comprising:

a generally channel-shaped inner annular receptacle, affixed about an exterior portion of said first component and said portion, having a central axis, an outwardly facing open front section, and being positioned in a first radial plane;

a generally channel-shaped outer annular receptacle, affixed about an interior portion of said second component and said portion, having a central axis coincident with said central axis of said inner receptacle, an inwardly facing open front section, and being positioned in a second radial plane, said first and second radial planes being displaced from one another along said axes; and

an annular-shaped flexible disc having a body, an inner edge disposed within and contacting said inner receptacle, and an outer edge disposed within and contacting said outer receptacle, whereby said disc is maintained in a generally conical configuration.

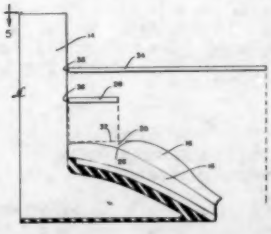
---

**4,369,894**

## FILAMENT WOUND VESSELS

**Richard L. Grover, and William D. Humphrey, both of Lincoln, Nebr., assignors to Brunswick Corporation, Skokie, Ill.**

**Filed Dec. 29, 1980, Ser. No. 220,972**
**Int. Cl.³ B65D 25/34, 90/02, 90/06**
**U.S. Cl. 220—414** **15 Claims**



1. In a filament wound pressure vessel which has a spherical portion including a polar opening, a plurality of layers of filaments comprising part of the thickness of the vessel and wound about said polar opening, and each layer comprising a sequence of polar winding patterns wound with incrementally increasing wind angles away from said polar opening creating voids at the junctures of adjacent winding patterns near the polar opening and thus between sequential layers at said junctures; a plurality of annular fill doilies installed in an annular region about said polar opening, each doiley to fill a respective one of said voids, the doilies being sized relative to the respective voids such that the outer circumference of each doiley is located generally at the juncture of adjacent winding patterns at the respective void.

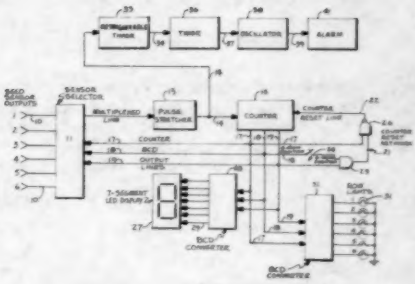
---

**4,369,895**

## SEED PLANTER MONITOR

**John J. McCarty, Peoria, and Kerry L. Meyer, Bloomington, both of Ill., assignors to Field Electronics Inc., Bloomington, Ill.**

**Filed Apr. 4, 1980, Ser. No. 137,302**
**Int. Cl.³ A01C 7/18**
**U.S. Cl. 221—3** **9 Claims**



1. A monitor for a seed planter operable to periodically dispense seeds in each of a plurality of rows, comprising:

seed sensing means for each row operable to provide an electrical signal at an output as each seed is dispensed;

seed sensor selector means in circuit with the seed sensing means outputs and being operable to provide, at a selector output, selector signals corresponding to the electrical signals supplied by a selected one of the seed sensing means;

advancing means in circuit with the selector output and operatively triggered by each said selector signal to control the seed sensor selector means for sequential selection of the seed sensing means outputs;

detecting means in circuit with the selector output for providing an alarm signal in the absence of a signal from a selected seed sensing means output during a predetermined time period; and

alarm means actuated in response to the alarm signal.

---

**4,369,896**

## HELICAL VENDING MACHINE WITH PIVOT PANEL ADJUSTMENT

**William C. Boettcher, Foley, Mo., assignor to D.O.V.E. Equipment Corporation, Winfield, Mo.**

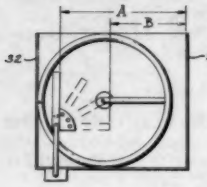
**Continuation-in-part of Ser. No. 35,421, May 2, 1979, Pat. No. 4,258,860, and a continuation-in-part of Ser. No. 139,991, Apr. 14, 1980, Pat. No. 4,312,460. This application Mar. 27, 1981, Ser. No. 248,559**
**Int. Cl.³ C07F 11/36**
**U.S. Cl. 221—75** **10 Claims**

1. A vending machine item discharge unit comprising:

(a) a tray means having a sidewall, a second sidewall, rear and bottom walls,

(b) helical means having a plurality of convolutions along its length to retain articles to be dispensed in the convolutions,

(c) drive means connected to the helical means to rotate said helical means in predetermined increments upon activation by a customer, and




(d) adjustable panel means positioned within the helical means toward one side thereof and movable between vertical and horizontal to vary the size of the article compartment defined between the panel and the second side wall of said tray.

---

**4,369,897**

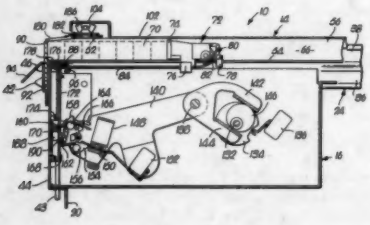
**PRODUCT STORING AND DISPENSING APPARATUS**

**Elmer B. Offutt, Independence; Edward Babich, Kansas City, both of Mo., and William G. Gillett, Kansas City, Kans., assignors to Fawn Engineering Corp., Des Moines, Iowa**

**Filed Oct. 23, 1980, Ser. No. 199,747**

**Int. Cl.³ B65H** *1/12*

**U.S. Cl. 221—227** **14 Claims**



1. In product storing and dispensing apparatus especially adapted for use in handling relatively rigid, elongate products, such as generally cylindrical rolls of mints, generally parallelepipedal packages of gum, or the like, and especially suited for employment in vending machines of types having a cabinet provided with an internal chamber, internal structure for supporting a number of typically drawer-like, product storage and dispensing assemblies in typically closely spaced, vertically overlying relationship to each other within said chamber, and a normally closed, frontal door typically including a transparent area to permit viewing by customers of products carried by said assemblies and adapted to be opened to provide service personnel with access to the front of said chamber:

base means adapted to be carried by said supporting structure and to remain within said chamber during both normal operation of said machine and the loading into the latter of products to be stored therein for dispensing therefrom, said base means including a stop means;

product carrying means for providing an elongate generally horizontally extending, open-top compartment having an end wall, side walls and means for providing bottom support surface zones for receiving from above and shiftably supporting therein elongate products of a corresponding type with their longitudinal dimension disposed substantially transversely to the longitudinal dimension of said compartment;

means for shiftably mounting said product carrying means upon said base means, with the longitudinal dimension of said compartment extending generally parallel to the front-to-rear dimension of said chamber, said end wall being disposed at the front extremity of said compartment, and said product carrying means being movable when said door is opened between a rearward, operating position entirely within said chamber and a forward, loading position extending out the front of said chamber;

means on said product carrying means for engaging and yieldably urging a rearmost product within said compartment forwardly to maintain all products within said compartment in side-by-side, successively interengaging relationship with the forwardmost product in engagement with said end wall when said product carrying means is in said operating position thereof, said urging means including a product pusher element, and spring means operably coupled with said element for yieldably biasing the latter in a forward direction along said compartment, a part of said element being automatically engagable with said stop means for blocking forward movement of said element relative to said base means and shifting the position of said element rearwardly with respect to said compartment whenever said product carrying means is moved away from its operative position toward its loading position, and whereby the forward urging force of said element is automatically removed from any products remaining within said compartment before said cover means may be moved to its open position, said element being automatically retained in a retracted position to facilitate the loading of products whenever said product carrying means is moved to its loading position, and the forward biasing force of said element is automatically restored to all products within said compartment upon returning said product carrying means to its operating position after restoring said cover means to its closed position;

cover means;

means for shiftably mounting said cover means upon said product carrying means for movement between an open position for exposing the open top of said compartment when said product carrying means is in its loading position and a closed position adjacently overlying all products disposed rearwardly of said forwardmost product within said compartment for preventing said rearward products from shingling or rising above the top of said compartment when they are subjected to the force of said urging means;

ejector means;

means for shiftably mounting said ejector means upon said base means for movement between a standby position clear of said product carrier means and the path of said movement of the latter and an ejecting position for engaging and lifting said forwardmost product out of said compartment to dispense the same from said product carrier means when the latter is in its operating position; and

selectively operable means operably coupled with said ejector means for moving the latter from said standby position to said ejecting position and back to said standby position thereof when said product carrying means is in its operating position.

---

**4,369,898**

**FILLING MACHINE**

**Ake Andersson, Slåtvarsgatan 23, Västra Frölunda, Sweden (42179)**

**Filed Mar. 8, 1978, Ser. No. 884,566**

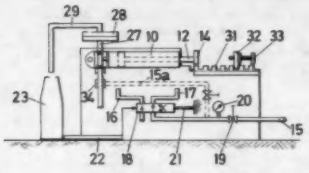
**Claims priority, application Sweden, Mar. 9, 1977, 77026318**

**Int. Cl.³ G01N** *15/08;* **B01D** *35/00*

**U.S. Cl. 222—4** **6 Claims**

1. A filling machine to handle liquid products comprising at least one quantitation pump, at least one piston servo motor

directly connected to the pump for driving the same, and means adapted to determine the stroke of said piston servo motor, a first non-return valve fitted at said at least one pump permitting a liquid product to be drawn into the pump through a supply conduit from a common source of supply, and a second non-return valve permitting said drawn-in product to




be expelled from said at least one pump through an outlet conduit to an individual container, a filter mounted in said outlet conduit, and valve means in said supply conduit and connected to a gas supply means, adapted, at will, to interrupt the connection between said source of supply and said pump, and to permit a pressurized gas to be supplied to said filter from said gas supply means for testing purposes.

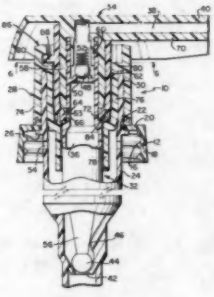
---

**4,369,899**

## DOWN-LOCKING PUMP

**Wallace F. Magers, Leawood, Kans., and Donald D. Foster, Kingsville, Mo., assignors to Realex Corporation, Kansas City, Mo.**

**Filed Nov. 18, 1980, Ser. No. 207,892**
**Int. Cl.³ B65D *47/34***
**U.S. Cl. 222—153** **7 Claims**



**1.** In a down-locking pump, the improvement comprising:
a tubular body having an inlet at one open end thereof and an annular collar at the opposite, open end thereof;
a valve operably associated with said inlet for opening and closing the same;
a tubular plunger telescopically and rotatively received by said collar for movement in opposite axial directions within the body through pumping strokes,
said plunger being operable, when fully depressed, to maintain said valve in a position sealably closing said inlet;
seal structure including cooperating portions on said collar and said plunger respectively and operable, when said plunger is fully depressed, to seal the interface between the collar and the plunger,
said cooperating portions of the seal structure, the collar, and the plunger all being constructed from the same material;
a plurality of generally radially outwardly projecting locking lugs carried by said plunger adjacent the normally outer end thereof;
a plurality of notches in said collar adapted to selectively receive said lugs of the plunger when the latter is in said fully depressed position;
a plurality of shoulders interspersed between said notches and disposed to restrictively overlie said lugs and prevent extension of the plunger when the lugs have been received in said notches and the plunger rotated relative to the collar,
said shoulders being provided with normally downwardly facing inclined surfaces disposed to bear against the normally upper extremities of said lugs with progressively increasing force as the plunger is rotated in one direction with the lugs disposed beneath the shoulders whereby to establish proper forcible interengagement between the portions of said seal structure and to properly maintain said inlet valve closed; and
limit means on said collar normally below said shoulders presenting a normally upwardly facing surface in spaced opposition to said downwardly facing surfaces of the shoulders for cooperating with the latter in traping said lugs against movement in either axial direction once the lugs have been locked beneath said shoulders to thereby absorb shock loading which would otherwise be transmitted to said seal portions,
the minimum spacing between said opposed traping surfaces of the collar being substantially the same as the thickness of said lugs in the axial direction.

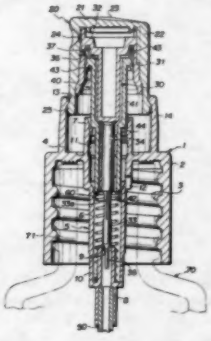
---

**4,369,900**

## MANUAL ACCUMULATOR TYPE ATOMIZER

**Tadao Saito; Takao Kishi, and Yoshiyuki Kakuta, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 320,005, Nov. 10, 1981, abandoned, which is a continuation of Ser. No. 146,394, May 5, 1980, abandoned. This application Feb. 10, 1982, Ser. No. 347,499**
**Claims priority, application Japan, May 16, 1979, 54-66089[U]; Jun. 28, 1979, 54-88980[U]**
**Int. Cl.³ B65D *47/34***
**U.S. Cl. 222—321** **6 Claims**



**1.** A liquid spraying device, comprising:
a container for holding liquids, having a neck portion;
an atomizer body having a peripheral portion for engaging the neck portion of said container, having a radially inwardly extending flange-like upper wall connected to said peripheral portion and a main cylindrical portion extending vertically from said upper wall, said main cylindrical portion having a lower, small-diameter hollow cylindrical portion and an upper, large-diameter cylindrical guide portion, said guide portion having an annular recess on its inner surface, a hole being perforated at the junction between said small-diameter lower cylindrical portion and said guide portion;

an atomizer head slidably held by said atomizer body, having an upper wall and a peripheral wall;

a large-diameter hollow cylindrical member, having an upper portion and a sidewall with an exhaust hole in the sidewall, held within the peripheral wall of said atomizer head;

an engaging member integral with the upper portion of said large-diameter cylindrical member having a downwardly extending rod portion and rod-like valve body which is slidably located in the small-diameter cylindrical portion of said atomizer body;

a piston member having a tubular portion which is slidably engaged on the rod portion of said engaging member having a skirt-like small-diameter piston at the lower end of said piston member surrounded by the small-diameter cylindrical portion of said atomizer body and a skirt-like large-diameter upper piston surrounded by said large-diameter cylindrical member, said exhaust hole being openable upon relative movement between said piston member and said large-diameter cylindrical member;

a suction tube engaged with the lowermost portion of said small-diameter cylindrical portion of said atomizer body for intake of liquid from said container;

spring means for upwardly urging said atomizer head, said piston member and said engaging member;

said atomizer body having a suction valve hole at the inside bottom of said small-diameter cylindrical portion of said atomizer body, said exhaust hole being in communication with a nozzle outlet formed in said atomizer head, a liquid passage being defined between the outer surface of said engaging member and the inner surface of said piston member, said valve body having a longitudinal slot formed at its upper portion for allowing communication between the small-diameter lower portion of said atomizer body and said suction tube when said valve body reaches a lowermost position.

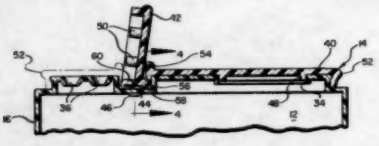
---

**4,369,901**

**SNAP-UP COVER FOR SPICE DISPENSER**

**Walter E. Hidding, Rte. 2, Wood Rock Rd., Barrington Hills, Ill. 60010**

**Filed Mar. 5, 1981, Ser. No. 240,893**
**Int. Cl.³ A47G *19/24***
**U.S. Cl. 222—480** **5 Claims**



1. In a closure to be assembled with a dispenser for dry powdered spice products, the dispenser including a hollow body having a spooning platform and a sifting platform at the top end, the respective platforms being spaced apart to define a parallel walled valley, the floor of which is perforated with stud-receiving apertures, the closure including a spooning cap arranged for snap-fit engagement with said spooning platform and further including a sifting cap arranged for snap-fit engagement with said sifting platform, said closure still further including a strap hingedly interconnecting said caps and fittably engaging the floor of said valley, studs depending from said strap entering said apertures for securely fastening said closure to said dispenser, the improvement comprising: a first snap-fit protuberance extending from the edge of said spooning cap adjacent the valley wall thereof; means defining a niche in the valley wall of said spooning cap; a second snap-fit protuberance extending from the edge of said sifting cap adjacent the valley wall thereof and aligned with said spooning cap niche; and means defining a niche in the valley wall of said sifting cap aligned with said first snap-fit protuberance, whereby one or the other of said caps may be selectively raised and locked into dispenser opening condition with the protuberance thereof snap-fit into the niche in the opposite valley wall.

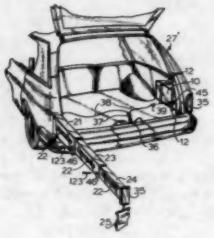
---

**4,369,902**

**RETRACTABLE LOAD CARRIER FOR VEHICLES**

**Steve Lampeas, 117 Aldershot La., Manhasset, N.Y. 11030**

**Filed Feb. 6, 1981, Ser. No. 232,276**
**Int. Cl.³ B60R *11/00***
**U.S. Cl. 224—42.42** **13 Claims**



1. A retractable, self-supporting load carrier for cantilever support of loads from the rear of a vehicle having a trunk and a pair of taillight openings, comprising:

a pair of spaced-apart, elongated telescoping, independently-operable channel supports disposed in the direction of travel of the vehicle, each support having a plurality of elongated, hollow, rigid channels telescopically received and nesting one within the other, said channel support being mountable within the trunk of said vehicle such that they are in alignment with one of said openings through which said channels may extend;

a lamp coupled to the innermost channel adjacent to an outwardly-directed end thereof; and

bracket means coupled to the outside channel of each telescoping support for securing said support to said vehicle within the trunk thereof.

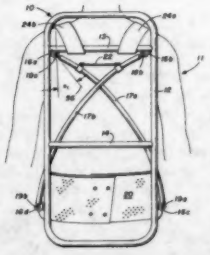
---

**4,369,903**

**BACKPACK FRAME**

**Donald F. Wilkes, 2816 Charleston NE., Albuquerque, N. Mex. 87110**

**Filed Jul. 16, 1981, Ser. No. 283,853**
**Int. Cl.³ A45F *3/10***
**U.S. Cl. 224—213** **19 Claims**



1. A pack frame for supporting a load on the back of a human wearer, said pack frame comprising:

a frame structure;

a belt-like support means adapted to fit about the hips of the wearer,

crossed-linkage means for flexibly connecting the upper

portion of said frame structure to said belt-like support means,

strap means attached at one end to said upper portion of said frame structure and adapted to pass over the shoulders of said human wearer; and

means to attach the other end of said strap means to said belt-like support means.

---

4,369,904

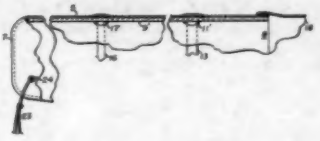
## SCABBARD FOR FIREARMS

George L. Christensen, 626 N., 1st West, Tremonton, Utah 84337

Continuation-in-part of Ser. No. 32,518, Apr. 23, 1979, abandoned. This application May 18, 1981, Ser. No. 264,645

Int. Cl.³ F41C *27/00*

U.S. Cl. 224—250 10 Claims



1. A scabbard for firearms, comprising:

a flattened, elongated tube having two substantially flat sides and having a closed end and an open end, and having a second opening at one edge of the tube intermediate the ends;

an elongated, spine-like stiffener permanently fastened to the inside of the tube at said edge thereof, approximately coextensive with the length of the tube and wide enough to space the two flat sides apart sufficiently to provide open space within the tube said stiffener having a loop at one end thereof extending outwardly through said second opening, a third in said one edge of said tube and large enough to provide an opening on each side of said tube so as to straddle said stiffener; and

a pair of straps passing around the tube with one through said third opening and the other through said loop for fastening the scabbard to other equipment.

---

4,369,905

## METHOD AND APPARATUS FOR GUIDING A CORRUGATED FIBREBOARD WEB

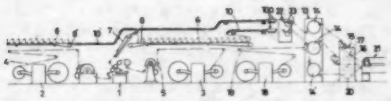
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Dec. 4, 1980, Ser. No. 213,154

Claims priority, application Japan, Dec. 5, 1979, 54-160189

Int. Cl.³ B65H *25/26, 25/32*

U.S. Cl. 226—17 10 Claims



1. A web guide systm for guiding a corrugated fibreboard web on a corrugating machine to prevent it from running out of true, said system comprising:

a pair of web guides movably mounted at the sides of said corrugating machine for movement transversely of the path of the web through said machine for guiding the edges of the running web,

a sensing means disposed upstream of said web guides and having at least one pair of sensors movable transversely for detecting and following the edges of the running web, and

a guide moving means responsive to the signal from said sensing means for moving said web guides transversely so that the distance between said web guides will be substantially equal to the width of the running web.

---

4,369,906

## WEB FEEDING MACHINES

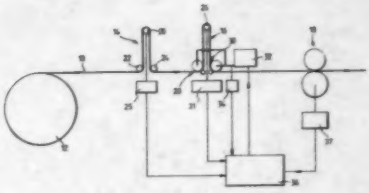
Jeffrey Isherwood, Enfield, England, assignor to Crosfield Electronics Limited, London, England

Filed Jun. 12, 1981, Ser. No. 273,151

Claims priority, application United Kingdom, Jun. 19, 1980, 8020092

Int. Cl.³ B65H *17/18, 23/18*

U.S. Cl. 226—42 4 Claims



1. A web feeding machine for controlling the feed of a web of material comprising:

a first pair of rollers bearing against one another to form a first nip;

a second pair of rollers bearing against one another to form a second nip, said second nip being located downstream from said first nip;

means to cause the ratio of the linear speed of said web through said second nip to the linear speed of said web through said first nip to be a constant and to have a value greater than one;

variable speed drive means for driving said nip rollers;

first tension monitoring means for monitoring the tension $T_1$ in said web upstream from said first nip;

second tension monitoring means for monitoring the tension $T_2$ between said first and said second nip; and,

control means to control said variable speed drive of said first and said second pairs of rollers whereby their angular velocity $\omega$ satisfies the expression:

$$\frac{\omega A(T_2 - T_1)}{B\,T_2 - T_1} = C$$

where A, B and C are constants.

---

4,369,907

## PUNCHING AND RIVETING MACHINE

Richard Muhr, Attendorn, and Karl Schink, Attendorn-Dünschede, both of Fed. Rep. of Germany, assignors to Muhr und Bender, Attendorn, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,670

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940661

Int. Cl.³ B21J *15/10*

U.S. Cl. 227—54 13 Claims

1. A puncher-riveter comprising:

a fixed lower part having an upper surface;

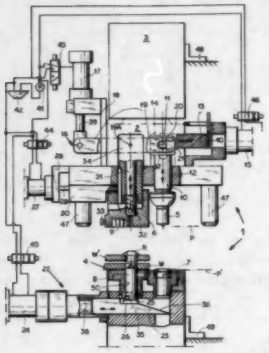
a vertically displceable upper part above said lower part and having a lower surface;

hydraulic means for vertically displacing said upper part toward and away from said lower part;

a punch having a lower punch end vertically displaceable on said upper part between an upper rest position with said lower end above said lower surface and a lower working

position with said lower end below said lower surface, said punch having an upper end formed as a punch head and a shaft interconnecting said head and lower end, said shaft being slidably guided in said upper part, said upper part having an abutment surface relatively closely juxtaposed with said head in said upper position of said punch and relatively far from said head in said lower position of said punch;

a slider displaceable when said punch is in said lower position between a blocking position between said head and said abutment surface for preventing upward displacement of said punch into said upper position and a position out of the way of said punch for permitting upward displacement of same into said upper position;



a die on said lower part in vertical alignment with said punch, said lower punch end being engageable in said die with said punch in said lower working position on displacement of said upper part down toward said lower part;

a rivet anvil on said lower surface of said upper part adjacent said punch; and

a rivet-setting tool having an upper tool end and vertically displaceable on said lower part below said rivet anvil between an upper working position with said upper end above said upper surface and a lower rest position with said upper tool end below said upper surface.

---

**4,369,908**

**STITCHERS**

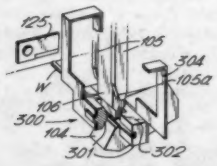
**Raymond A. Harvey, Hertfordshire, England, assignor to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 21, 1979, Ser. No. 106,185**

**Claims priority, application United Kingdom, Jan. 30, 1979, 7903129**

**Int. Cl.³ B27F** *7/21, 7/23*

**U.S. Cl. 227—90** **5 Claims**



1. A wire stitcher apparatus having an anvil, a driver and a staple former wherein a piece of wire is cut from a supply of wire and driven through a set of sheets to bind the sheets together, the improvement including guide means for the wire for guiding the same into position relative to the driver and former, said guide means including at least one guide member arranged in the path of the former and being resiliently mounted so as to be displaced by the former during forming, means for resiliently biasing the anvil with the wire positioned thereon during the cutting of the wire and the forming of a staple and to displace the anvil during the driving motion of the driver through a set of sheets, and means formed on the driver and the anvil for positively gripping the wire during cutting and forming and wherein said guide means includes two guide members movable toward and away form each other.

---

**4,369,909**

**GLAZIER'S POINT DRIVER**

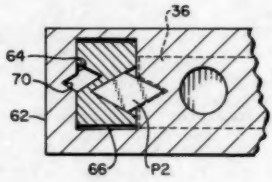
**Eugene W. Grzeika, 170 Park St., Bristol, Conn. 06010**

**Division of Ser. No. 924,447, Jul. 13, 1978, Pat. No. 4,342,414.**

**This application Jun. 13, 1979, Ser. No. 48,000**

**Int. Cl.³ B25C** *5/00*

**U.S. Cl. 227—109** **12 Claims**



1. In a glazier's point driver having a frame defining a magazine for the points, a point driving plate supported by the frame, trigger means for operating said point driving plate, and means biasing a stack of points in said magazine toward one end of the magazine wherein the endmost point is in position to be driven by the plate, the improvement to said magazine comprising elongated insert means for said magazine and defining a first guide surface for engaging a stack of points of one particular size and shape, said insert means defining a second guide surface for engaging a stack of points of a second and different size and shape, said insert means mounted in said frame to cooperate with said magazine when oriented in a first and a second position alternatively, said stack biasing means and said point driving plate adapted to operate as aforesaid with said insert means in both said alternative positions.

---

**4,369,910**

**METHOD OF CONNECTING ARMATURE COIL OF ROTARY MACHINE**

**Isao Hamano, and Kiyoshi Yabunaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**PCT No. PCT/JP80/00086, § 371 Date Oct. 14, 1980, § 102(e) Date Oct. 14, 1980, PCT Pub. No. WO80/02480, PCT Pub. Date Nov. 13, 1980**

**PCT Filed Apr. 24, 1980, Ser. No. 198,007**

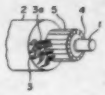
**Claims priority, application Japan, Apr. 27, 1979, 54-53921**

**Int. Cl.³ B23K** *20/10*

**U.S. Cl. 228—110** **2 Claims**

1. In a method of connecting an armature coil of a rotary machine to a segment by applying ultrasonic vibration to the armature coil, said rotary machine comprising the armature and a commutator fitted in the circumference of the shaft and formed by molding with a molded substrate a plurality of the segments to be in one piece, an improvement which comprises applying ultrasonic vibration for welding to the armature coil in the direction substantially perpendicular to the axial direc-

tion of the shaft to perform the welding whereby a component of vibrating force in the axial direction of the shaft is smaller



than the force necessary to overcome the bonding strength of the molded substrate to the segment.

---

**4,369,911**

**METHOD OF MAKING A GAS-TIGHT CONNECTION BETWEEN A CORRUGATED HIGH QUALITY TUBE AND A HIGH QUALITY STEEL SLEEVE**

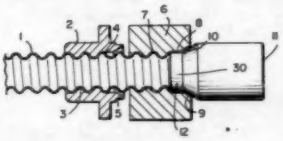
**Guenther Blumenberg, Hanover-Doehren, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette AG, Hanover, Fed. Rep. of Germany**

**Filed Jul. 1, 1980, Ser. No. 164,920**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001666**

**Int. Cl.³ B23K** *9/02, 5/02*

**U.S. Cl. 228—173 F** **6 Claims**



1. A method of making a gas-tight connection between an open end portion of a thin walled corrugated, high quality metallic tube and a metallic sleeve whose interior surface includes helical threads that correspond to the helical corrugations on the outer surface of the metallic tube, comprising the steps of:

screwing the sleeve onto the tube to a position and orientation such that a flanged interior surface of the sleeve, flanged radially at an angle of 15–45 degrees, faces, but is longitudinally separated from, the open end portion of the tube to which the sleeve is to be bonded;

decorrugating and expanding the open end portion of the tube;

flanging the decorrugated and expanded open end portion of the tube at an angle of 15–45 degrees in a manner so as to be parallel to the flanged interior surface of the sleeve;

screwing the sleeve on the tube toward the open end portion of the metallic tube until the parallel flanged interior surface of the sleeve and the outer surface of the tube at its flanged open end portion engage each other in an area of circumferential contact; and

fusion welding the tube onto the sleeve in the area of circumferential contact, by welding along the circumference of the interior surface of the flanged end portion of the tube opposite the area of circumferential contact.

---

**4,369,912**

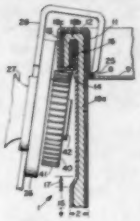
**COMPOSITE CAN WITH COMPRESSED END TO PROVIDE EASY OPENING**

**Harold D. Abner, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jun. 17, 1981, Ser. No. 274,346**

**Int. Cl.³ B65D** *3/10, 5/00, 13/00*

**U.S. Cl. 229—5.6** **6 Claims**



1. A composite can comprising a hollow laminated body including at least one layer of fibrous paper material and having at least one seamed metal end closure closing an end of said body and specifically designed to facilitate opening thereof with a can opener of the type having a cutter element and a toothed driving wheel, said end portion of said hollow laminated body adjacent said seamed metal end closure being compressed to an outside diameter smaller than that of the uncompressed portions of said hollow laminated body, said compressed end portion of said body adjacent said seamed metal end closure being of sufficient overall length to substantially eliminate interference between said toothed driving wheel and said laminated body, whereby shredding of the outermost surface of said hollow laminated body by said toothed driving wheel during opening is substantially eliminated.

---

**4,369,913**

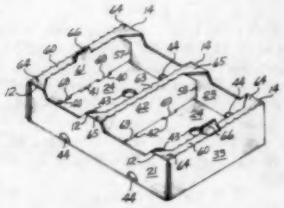
**TRAY**

**Herbert D. Muise, Orange, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Aug. 31, 1981, Ser. No. 297,792**

**Int. Cl.³ B65D** *5/48*

**U.S. Cl. 229—30** **8 Claims**



1. A tray comprising

a double-ply base panel formed from first and second base panels which are coextensive,

a side panel extending upwardly from each of said first and second base panels,

an upper section extending between said side panels and being parallel to said base panel,

a double-ply end panel extending upwardly from each end of said double-ply base panel,

each of said double-ply end panels being formed from first and second end panels, said first end panels being hingedly attached to said first base panel and said second end panels

being hingedly attached to said second base panel, said first and second end panels being coextensive,
means holding said end panels in said upright position.

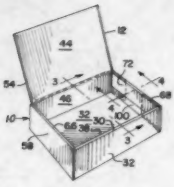
---

**4,369,914**

## BOX TYPE CARTON WITH HINGED LID

**Joseph Langston, Jr., Jacksonville, Fla., and Robert J. Murray, Norcross, Ga., assignors to Federal Paper Board Company, Inc., Montvale, N.J.**

**Filed Jun. 4, 1981, Ser. No. 270,594**
**Int. Cl.³ B65D 5/64, 5/56**
**U.S. Cl. 229—33** **6 Claims**



1. A box in the form of a tray with a hinged lid which is adapted for the packaging of cigars or similar articles, said box being formed from a single cut and scored blank of relatively light weight paperboard, said box having a body portion comprising a rectangular bottom wall, front and back sidewalls and end walls which are upstanding from the peripheral edges of the bottom wall, and a planar lid hinged along one edge thereof to the top edge of the back wall, the front, back and end walls having outer and inner panels, the inner panels on the front and end walls each being folded downwardly from a top edge of the wall which top edge has substantial width and said inner panels being secured on the inside of said upstanding walls, the front and back wall forming outer panels having hinged corner connecting panels secured between the inner and outer panels of the end walls, and a reinforcing panel insert of substantial thickness secured between the inner and outer panels of said front and end walls, said hinged lid comprises an outer and inner panel of substantially the same size, and reinforcing panels hinged to the opposite end edges of one of said outer and inner panels and adhesively secured between said outer and inner panels so as to form a substantially rigid reinforced, planar lid structure.

---

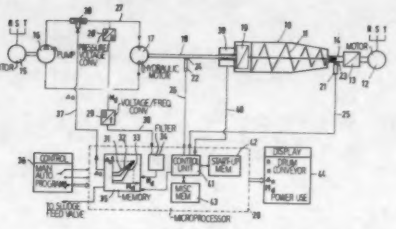
**4,369,915**

## METHOD AND APPARATUS FOR REGULATING THE DIFFERENTIAL RPM OF TWO ROTATING PARTS

**Hans-Joachim Oberg, Roesrath; Wolf-Diethard Gruenberg, and Guenther Posse, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany**

**Filed Feb. 13, 1981, Ser. No. 234,382**
**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005658**
**Int. Cl.³ B04B 9/02**
**U.S. Cl. 494—8** **9 Claims**

1. A method for regulating the differential rpm of a centrifuge drum and an internally disposed worm conveyor in a worm centrifuge, said drum and said conveyor rotating at different speeds comprising the steps of:
measuring the individual speeds of said drum and conveyor;
supplying electronic signals corresponding to the measured speeds of said drum and said conveyor to a microprocessor;
generating a pulse train for each of said drum and said conveyor having pulses corresponding to one rotation of said drum and said conveyor;
sampling said pulse train at a frequency greater than the rotational frequency of said drum and said conveyor;
counting the number of samplings between two or more pulses received in said microprocessor;
calculating a quotient corresponding to said number of samplings for each pulse train;
calculating a differential rpm between said drum and said conveyor from the quotients for said pulse trains;



comparing said calculated differential rpm to an optimum rpm value; and
supplying a signal to a means for changing the rotational speed of said worm conveyor if said calculated differential rpm deviates from said optimum rpm.

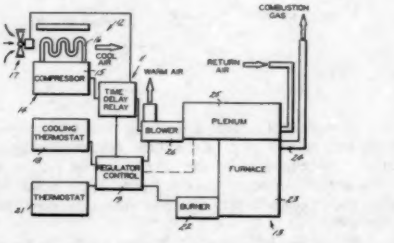
---

**4,369,916**

## ENERGY SAVING OVERRIDE BLOWER CONTROL FOR FORCED AIR SYSTEMS

**Dean M. Abbey, 1312 Wood, Lansing, Mich. 48912**

**Filed Nov. 3, 1980, Ser. No. 202,886**
**Int. Cl.³ F24N 19/10**
**U.S. Cl. 236—11** **2 Claims**



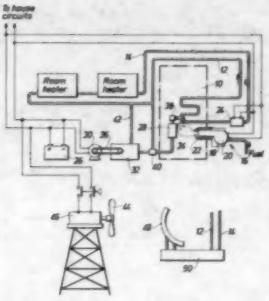
1. An overide control element wired for connection to regular thermal controls to heating and air conditioning blowers comprising:
a control box;
a chassis in said control box;
a time delay relay support socket secured to said chassis;
a time delay relay on said time delay relay support socket;
an override relay socket separate from said time delay relay support socket;
at least one override relay on override relay socket;
wiring integrating said time delay relay with said override relay; and
leads for operable connection of said relays to said regular thermal control and to blowers served thereby whereby said blowers are activated upon energization of said regular controls and are continued for a selected interval beyond de-energization of said regular controls.

**4,369,917**

## CENTRAL HEATING SYSTEM

**Carl T. Schnell, P.O. Box 374, Motala, Sweden (S-591 24)**

**Filed Feb. 5, 1980, Ser. No. 118,728**
**Claims priority, application Sweden, Feb. 9, 1979, 7901146**
**Int. Cl.³ F24D *1/04*; F01K *13/02***
**U.S. Cl. 237—12.1** **5 Claims**



1. A central building heating system having boiler means using a liquid as a heat carrying medium for conveying heat from said boiler to said building, burner means for heating said liquid, steam generating means and room heating means and said boiler being interconnected by conduits for said heat carrying medium, said steam generator means being located to be heated by a flame of the burner means, liquid level control means for supplying the medium to the steam generating means and said conduits extending from said boiler to the room heating means, relief valve means for returning steam from said steam generating means to said room heating means when steam pressure exceeds a predetermined value, electrical apparatus initially requiring electrical power before said system can be started, said burner means including an electrically operated pump which must be initially operated for supplying fuel, electrically operated fan means which must be initially operated for supplying combustions air, electrically operated ignition electrodes which must be initially operated to ignite said fuel, the system also including an electrically operated pump means for circulating the heat carrying medium through said conduits after said heating system is in operation, a chargeable electric battery for providing the initial power required for said initial operations, electric generator means for charging said battery and operating said electrical apparatus, steam engine means connected to said steam generator via said relief valve means and driven by steam from said steam generating means after said heating system is in operation, means directly responsive to the rotational movement of the steam engine means after said heating system is in operation for driving the electric generator means, which is dimensioned to give charging electric energy which exceeds the total electric energy required to drive the electric current consuming apparatus, whereby said apparatus is operated and said battery is recharged by said electric generating means.

---

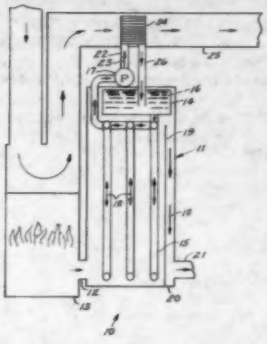
**4,369,918**

## HEAT RETRIEVER APPARATUS

**Paul E. David, 10433 Sharp Rd., Swartz Creek, Mich. 48473, and Leland M. Hyde, 15622 El Paso Dr., Fenton, Mich. 48430**

**Filed May 28, 1980, Ser. No. 152,435**
**Int. Cl.³ F24B *7/00***
**U.S. Cl. 237—55** **1 Claim**

1. A heat retriever apparatus, comprising, in combination, an upward housing along a chimney pipe through which smoke and hot exhaust gases travel from the furnace to the chimney of a house, the hot air heating system of said furnace including a hot air duct from a hot air heating chamber above a fire box of said furnace which has a fluid circulating system to heat the air inside said duct further, comprising interconnected pipes inside a compartment of said housing carrying a fluid, heated inside said interconnected pipes by said hot exhaust gases, an outlet of said interconnected pipes extending out the upper end of said housing and being connected through a pump of a heat dissipating radiator inside said hot air duct for said heated fluid, heating said radiator, an outlet of said radiator extending back into said housing and being connected to a closed reservoir



that is connected to the inlet of said interconnected pipes for recirculating again; said housing having an inlet and an outlet near the lower end thereof for connection to said chimney pipe, vertical baffle positioned between the interconnected tubes and the housing wall containing the exhaust gas outlet where said baffle extends from the bottom of the housing vertically upward substantially above the housing exhaust gas outlet to form a downward exhaust gas passage to the housing wall exhaust gas outlet.

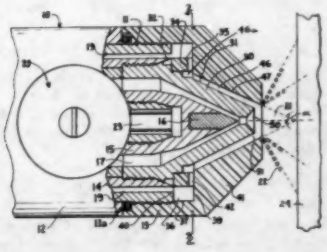
---

**4,369,919**

## PLASMA TORCH FOR PROCESSING METALS IN THE AIR AND UNDER WATER

**Marin G. Beloev; Ivan V. Vangelov; Dimo T. Garlanov, all of Sofia; Nikolay Y. Nikov, Varna; Ivan S. Savov, and Vladimir P. Hlebarov, both of Sofia, all of Bulgaria, assignors to Npk za Kontrolno Zavarachni Raboti, Sofia, Bulgaria**

**Filed Oct. 31, 1980, Ser. No. 202,728**
**Int. Cl.³ B05B *15/00*; B23K *9/16***
**U.S. Cl. 239—79** **3 Claims**



1. A plasma torch having a body with a front end and a rear end, a nozzle on the front end of the body, the nozzle having a plasma stream discharge opening therein, an anode and a cathode disposed in spaced relationship within the body rearwardly of the nozzle, a gas conducting channel extending between the anode and the cathode and forwardly out of the plasma stream discharge opening in the nozzle, the nozzle having an annular water-discharging opening therein sur-

rounding the plasma discharge opening, so as to surround the plasma stream discharge from the nozzle with a plasma shielding compact water stream, a water-conducting channel in the body leading to the water discharging opening therein, and means interposed in the water-discharging passage to impart a whirling motion to the water stream surrounding the plasma stream discharged from the nozzle.

---

**4,369,920**

## ARRANGEMENT TO COOL THE THRUST NOZZLE FOR A ROCKET ENGINE

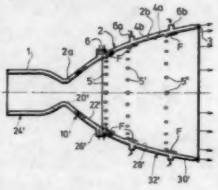
**Günther Schmidt, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany**

**Filed Nov. 26, 1980, Ser. No. 210,843**

**Claims priority, application Fed. Rep. of Germany, Dec. 8, 1979, 2949522**

**Int. Cl.³ F02K *11/00***

**U.S. Cl. 239—127.3** **8 Claims**



1. A rocket engine, comprising a housing having a combustion chamber portion, a thrust nozzle having one end connected to said combustion chamber portion and having a front nozzle section adjacent said combustion chamber with a narrow throat portion and a front divergent wall part diverging outwardly from said narrow throat portion and including a rear nozzle section with a rear divergent wall part connected to the rear end of said front divergent wall part and terminating at its rear end in a thrust discharge, cooling fluid channel flow means associated with said combustion chamber in said front nozzle section for supplying a coolant thereto for the cooling thereof, said rear nozzle section including walls defining a coolant channel extending along the length of said rear nozzle section, at least one inlet connected into said cooling channel for supplying a coolant to said cooling channel and a plurality of outlets connecting from said cooling channel to the interior of said rear thrust nozzle section including longitudinally spaced outlets arranged along the length of said rear thrust nozzle section and providing a fluid film flow to the interior wall of said rear thrust nozzle section.

---

**4,369,921**

## HOSE-END SPRAYER

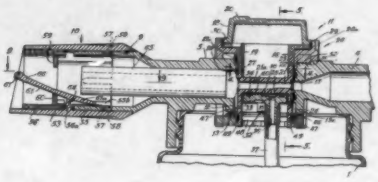
**John L. Beiswenger, Salem; Howard R. Moon, Ft. Atkinson, both of Wis.; Frank A. Smiesko, McHenry, and Dhananjay Chaphalkar, Lindenhurst, both of Ill., assignors to Acme Burgess, Inc., Grayslake, Ill.**

**Filed Dec. 12, 1980, Ser. No. 215,333**

**Int. Cl.³ B05B *7/28***

**U.S. Cl. 239—317** **9 Claims**

1. In a hose-end sprayer comprising a chemical concentrate jar and a top closure therefor having an axial vertical bore therein and horizontal inlet and outlet snouts opening at diametrically opposite surfaces of said bore, a flow control assembly mounted atop and within said bore in said closure, said assembly comprising a rotary valve and a metering valve arranged axially within said bore for mutually independent rotary manipulation, said metering valve having a knurled welled ring resting atop said closure with a pair of diametrically spaced bracket arms depending into said bore at the surface thereof, said rotary valve having a knobbed top resting within the well of said ring and a flat-bottomed cylindrical valve plug depending from said knobbed top through said ring and into said bore, said plug having a diametric inlet- and outlet-ended passageway therethrough at the level of said snouts adapted to connect the same, a horizontal upwardly open metering flow channel labyrinth affixed to the ends of said bracket arms facing the flat bottom of said cylindrical valve body, said labyrinth having an opening at the inlet end of the flow channel thereof and means connecting said opening with the space at the bottom of said jar, said flat bottom of said valve plug having an opening therein communicating with said



diametric passageway and so eccentrically arranged as to selectively align and connect with predetermined points between the inlet and terminal ends of said metering flow channel upon relative rotational movement of said labyrinth and said valve plug to incorporate corresponding degrees of resistance to the flow of liquid from said jar to said passageway, the portion of said passageway in said plug downstream from said opening in the bottom of said plug diverging whereby to create suction at said opening to draw concentrate from said jar when water is flowing through said passageway.

---

**4,369,922**

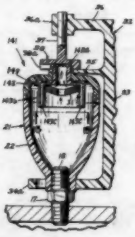
## SPRINKLER HEAD FOR A CENTER PIVOT IRRIGATION SYSTEM

**Merle A. Vikre, 32 Windward Way, New Port Richey, Fla. 33552**

**Continuation of Ser. No. 173,993, Jul. 31, 1980, abandoned, which is a division of Ser. No. 971,038, Dec. 19, 1978, Pat. No. 4,231,523, which is a continuation of Ser. No. 765,266, Feb. 3, 1977, abandoned. This application Feb. 9, 1982, Ser. No. 347,302**

**Int. Cl.³ B05B *1/32***

**U.S. Cl. 239—454** **20 Claims**



1. A sprinkler head for use in a center pivot irrigation system, comprising:

(a) housing means adapted for connection to a source of water, the housing means defining an internal chamber with a water inlet and outlet, the outlet being constructed to issue a jet of water therefrom;

(b) volume control means associated with the housing means for controlling the jet of water issuing from said outlet so that its volume output is substantially constant;

(c) the housing means further comprising a wall member projecting internally into the chamber from the outlet in encircling relation thereto and in general alignment therewith,

the wall member defining a free open end through which water is received from the inlet, the wall member at its free end having an internal transverse dimension larger than the transverse dimension of said inlet and outlet, and said wall member being spaced from the internal wall of the internal chamber to define a dead ended annular space therewith in which air may be caught to act as a shock absorbing cushion of incoming water;

(d) spray deflector means for intercepting the jet of water and deflecting it into a predetermined spray pattern;

(e) the spray deflector means being supported for movement relative to said outlet between a first position protectively covering the outlet and a second position spaced from the outlet to create said spray pattern;

(f) the spray deflector means being movable from the first position to and maintained in the second position by said jet of water, and returnable to the first position in the absence of said jet of water.

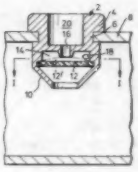
---

**4,369,923**

## SELF-REGULATING NOZZLE FOR A LIQUID SUPPLY LINE

**Dan Bron, 36 Palmach St., Haifa, Israel**

**Filed Aug. 13, 1980, Ser. No. 178,117**
**Claims priority, application Israel, Sep. 4, 1979, 58176**
**Int. Cl.³ B05B *15/00***
**U.S. Cl. 239—542** **8 Claims**



1. A self-regulating nozzle for a liquid supply line, comprising a nozzle body attachable to said line, a cylindrical vortex chamber within said body, a vortex producing inlet means extending tangentially through the wall of said body through which the liquid in said line enters said vortex chamber, one end wall of said cylindrical chamber being constituted by one surface of a stretchable diaphragm and the opposite end wall of said chamber being provided with a central aperture leading to the consumer, the other surface of said diaphragm being exposed to line pressure, wherein the vortex produced within said chamber by flow of liquid through said tangential inlet means results in the creation of a low pressure zone on said one surface of the diaphragm and the effective cross-section of said central aperture is controlled by the stretching of said stretchable diaphragm.

---

**4,369,924**

## ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

**Teru Morishita, Shizuoka; Matsuyoshi Sugiyama, Susono, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

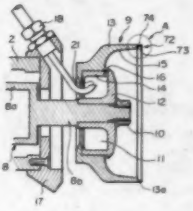
**Filed Jul. 30, 1980, Ser. No. 173,608**
**Claims priority, application Japan, Apr. 4, 1980, 55-43452**
**Int. Cl.³ B05B *5/04***
**U.S. Cl. 239—703** **15 Claims**

1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

a metallic rotary shaft having a longitudinal axis, said metallic rotary shaft being rotatably arranged in said housing and having a front end and a rear end;

a cup shaped metallic spray head fixed onto said front end of said rotary shaft and having an outer wall which is substantially cylindrical so as to have a substantially constant radius over a predetermined axial length, said predetermined axial length extending axially forward in a direction parallel with said longitudinal axis to a point thereon corresponding to a forwardmost axial extension of said cup shaped metallic spray head, a cup shaped inner wall having a first inner wall portion axially arranged within said predetermined axial length, said first inner wall portion forming a radially expanding inner wall which smoothly and continuously radially approaches said substantially cylindrical outer wall at a first approach rate with respect to forward axial translation, a second inner wall portion which is axially contiguous with said first inner wall portion and within said predetermined axial length, said second inner wall portion forming a discontinuous portion which radially approaches said substantially cylindrical outer wall at a second approach rate which substantially exceeds said first approach rate with respect to forward axial translation so as to produce an annular step extending radially outward, and a third inner wall



portion which is axially contiguous with said second inner wall portion and within said predetermined axial length, said third inner wall portion forming an annular tip wall projecting axially forward from an outer periphery of said annular step in said second inner wall portion and extending to said forwardmost axial extension of said cup shaped metallic spray head;

feed means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

non-contact type radial bearing means arranged in said housing and cooperating with said rotary shaft for radially supporting said rotary shaft under a non-contacting state;

non-contact type thrust bearing means arranged in said housing and cooperating with said rotary shaft for axially supporting said rotary shaft under a non-contacting state;

terminal means for receiving a negative high voltage and being connected to said housing; and

electrode means arranged in said housing for electrically connecting said terminal means to said spray head.

---

**4,369,925**

## ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

**Teru Morishita, Shizuoka; Matuyoshi Sugiyama, Susono, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Oct. 10, 1980, Ser. No. 195,850**
**Claims priority, application Japan, May 21, 1980, 55-66364**
**Int. Cl.³ B05B *5/04*; F16C *7/04, 17/10***
**U.S. Cl. 239—703** **21 Claims**

1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

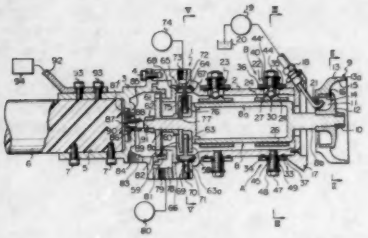
a metallic rotary shaft rotatably arranged in said housing and having a front end and a rear end;

a cup shaped metallic spray head fixed onto the front end of said rotary shaft and having a cup shaped inner wall;

feeding means for feeding a paint onto said cup shaped inner wall;

drive means cooperating with said rotary shaft for rotating said rotary shaft;

a pair of radial air bearings arranged in said housing and cooperating with said rotary shaft for radially supporting said rotary shaft under a non-contacting state, each of said radial air bearing comprising a bearing frame connected to said housing, a plurality of pads, each having an inner face which extends along a circumferential outer wall of said



rotary shaft and spaced from the circumferential outer wall of said rotary shaft by a slight distance, and a plurality of support pins, each being connected to said bearing frame and pivotally supporting said corresponding pad;

electrically connecting means always electrically connecting said pads to said housing;

non-contact type thrust bearing means arranged in said housing and cooperating with said rotary shaft for axially supporting said rotary shaft under a non-contacting state;

a generator generating a negative high voltage and having an output connected to said housing, and;

electrode means arranged in said housing and electrically connecting said output to said spray head.

---

**4,369,926**

## METHOD AND APPARATUS FOR GRINDING GRANULAR MATERIALS

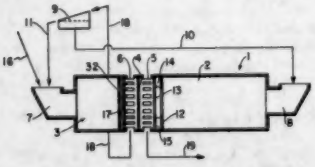
**Ole S. Rasmussen, and Peter Lund, both of Copenhagen, Denmark, assignors to F. L. Smidth & Co., Cresskill, N.J.**

**Filed Dec. 28, 1979, Ser. No. 107,846**

**Claims priority, application United Kingdom, Dec. 29, 1978, 50281/78**

**Int. Cl.³ B02C *17/06***

**U.S. Cl. 241—18** **29 Claims**



1. A method of dry grinding granular material in a grinding tube mill having a final and at least one preceding grinding compartment containing grinding bodies, comprising directing the material to the tube mill, grinding the material in the preceding compartment, discharging the preground material from the preceding compartment through openings in the mill, dividing the preground material into fine and coarse fractions by a separation process, returning the coarse fraction to the preceding compartment, directing the fine fraction to the final compartment for grinding therein, discharging the ground material from the final compartment together with any grinding bodies carried therewith, separating the grinding bodies from the material discharged from the final compartment in the tube mill proper, and returning the grinding bodies to the final compartment.

---

**4,369,927**

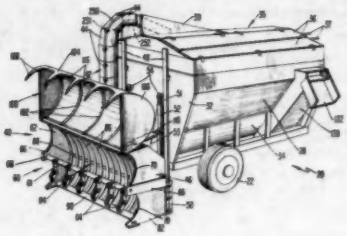
## SELF-LOADING FEED MIXER AND TRANSPORT APPARATUS WITH IMPROVED GRINDING AND LOADING MECHANISM

**Antonie G. Rozeboom, R.R. No. 1, Doon, Iowa 51235**

**Filed Jun. 20, 1980, Ser. No. 161,307**

**Int. Cl.³ B02C *13/26***

**U.S. Cl. 241—73** **24 Claims**



1. A feed transport apparatus adapted to be transported on the ground and positioned adjacent to a stack of feed material, said feed transport apparatus having a feed compartment adapted to receive a load of feed material and a loader mechanism for grinding and loading the stack of feed material into the compartment, said loader mechanism comprising:

an open-faced loader housing mounted outside of said feed compartment;

feed pulverizing means mounted within said open-faced loader housing and exposed via said open-faced housing for engagement with the stack of feed material;

a screen mounted within said housing and cooperable with said pulverizing means for grinding the feed material therebetween;

means for conveying the ground feed material from said housing into said feed compartment;

grappling means pivotally mounted on top of said open-faced loader housing and adapted to pivot downward for urging the feed material from the stack into said housing and engagement with said pulverizing means;

means for pivoting said grappling means downward relative to said housing into the stack of feed material to draw the feed material into said housing; and

said loader housing being vertically adjustable in position relative to said feed compartment to permit said loader mechanism to operate on the stack of feed material at different levels.

---

**4,369,928**

## APPARATUS FOR FORMING A LONG LEADING END IN A WIRE WHEN WINDING SAID WIRE ON A REEL

**Asko S. Riekkinen, Kirkkonummi, and Allan F. Rönneberg, Helsinki, both of Finland, assignors to Oy Nokia AB, Helsinki, Finland**

**Filed Nov. 12, 1980, Ser. No. 206,262**

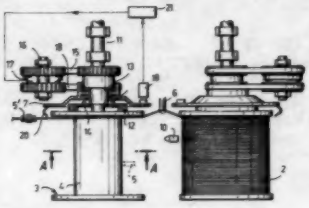
**Claims priority, application Finland, Nov. 12, 1979, 793539**

**Int. Cl.³ B65H *54/02***

**U.S. Cl. 242—25 A** **3 Claims**

1. In an apparatus for forming a long leading end to a wire when winding the wire on reels including a reel mounted on a reel shaft, means for rotating the reel shaft, a shifting flange for shifting the wire from another reel to said reel, said flange being mounted for rotation concentrically with said reel and

adjacent to a flange of the reel, a gripper element on said shifting flange for gripping the wire and means for causing the rotational speed of the shifting flange to lag behind the rotational speed of the reel to create the leading end, the improvement comprising a friction clutch for transmitting rotary motion from the reel shaft to the shifting flange but that permits the flange to slide relative to the shaft, an auxiliary shaft mounted apart from and parallel to the reel shaft, first gear



means connecting said reel shaft with said auxiliary shaft and second gear means connecting said auxiliary shaft with said shifting flange, the gear ratio of said second gear means being slightly larger than the gear ratio of said first gear means and coupling means for selectively connecting and disconnecting the first gear means with the second gear means whereby the shifting flange rotates at the same speed as the reel when the coupling means are disconnected and at a speed slower than the reel when the coupling means is connected.

---

**4,369,929**

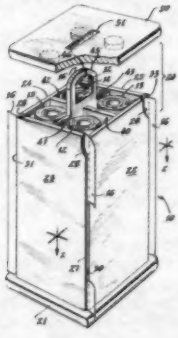
## DISPENSER FOR ROLLED SHEET GOODS

**Pierre W. Cayer, 33 Bungay Ter., Seymour, Conn. 06483**

**Filed Dec. 19, 1980, Ser. No. 218,046**

**Int. Cl.³ B65H *19/04***

**U.S. Cl. 242—55.42** **18 Claims**



6. A dispenser for rolled sheet goods comprising:

(A) a housing having a plurality of sidewalls arrayed in a polygonal shape and adapted to receive a number of rolls of sheet goods equal to the number of sidewalls of the housing, the housing defining one vertical slot for each roll of sheet goods received and enclosed therein through which the rolls of sheet goods may be respectively withdrawn; and

(B) stop means at the top of the housing for engaging the upper ends of the rolls of sheet goods upon application of pressure to said stop means, thereby preventing the sheet goods from unrolling when the stop means are engaged,

whereby the desired amount of sheet goods from a selected one of the rolls of sheet goods may be withdrawn through its respective slot and pressure may be applied to the stop means to prevent additional sheet goods from being withdrawn through the slot as the sheet goods are held in tension and torn off at the edge of the slot.

---

**4,369,930**

## FISHING REEL

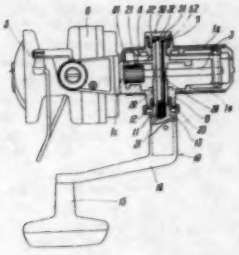
**Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan**

**Filed Dec. 21, 1981, Ser. No. 333,179**

**Claims priority, application Japan, Dec. 28, 1980, 55-188814[U]**

**Int. Cl.³ A01K *89/01***

**U.S. Cl. 242—84.1 J** **2 Claims**



1. A fishing reel comprising:

a reel body having a pair of opposite side walls and a front wall, cylindrical bosses at said side walls, and a shaft bore at said front wall;

a rotary frame supported freely rotatably to said reel body and having a pinion;

a spool supported freely slidably to said reel body, and,

a drive mechanism for rotating said rotary frame and comprising: a handle, a tubular main shaft, and a screw shaft, said handle comprising a shaft portion having a threaded bore and an engaging bore, a lever portion, and a grip, said tubular main shaft being supported rotatably to said cylindrical bosses and supporting at an intermediate portion a master gear engageable with said pinion and having at both axial ends engaging portions which are not-round at their respective outer peripheries, each said engaging portion being capable of engaging with said engaging bore at said handle in relation of being not rotatable relative to said handle, said screw shaft being supported to said tubular main shaft and having at the outer periphery of one axial end a screw thread screwable with said threaded bore at said handle and at the other axial end a head having an outer periphery which is not-round the same as the outer peripheries of said engaging portions at said tubular main shaft, said screw shaft screwing with said threaded bore at said handle, thereby coupling said handle with said tubular main shaft, said drive mechanism further comprising a cap having a not-round inner surface engageable with one of said engaging portions at said tubular main shaft and with the head of said screw shaft, so that the not-round inner periphery of said cap engages with said one engaging portion and head to thereby couple said screw shaft with said tubular main shaft in relation of being not-rotatable relative thereto and integral with said handle.

4,369,931

## REDIRECTING DEVICE FOR SAFETY BELTS

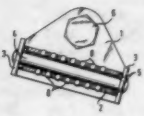
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,448

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1977, 2736115

Int. Cl.³ A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 5 Claims



1. A redirecting device for a safety belt in which one end of the safety belt is rolled up on an automatic winder in an end region and the other end of the safety belt has a fitting for connecting the belt to a lock, a redirecting member supported in the redirecting device, over which member the belt passing in contact with the redirecting member is led in the redirection region, the redirecting member comprising in the contact zone of the belt a rotatable member having a wall as the outer surface around which the belt is partially looped, with the rotatable member of width greater than the width of the belt to extend beyond the belt on both sides, and roll elements supporting the rotatable member to permit the rotatable member to rotate freely, and wherein additional roll elements are disposed in the central region of the rotatable member which project beyond the wall of the rotatable member on both sides of the wall.

---

4,369,932

## AUTOMATIC WIND-UP ROLLER FOR A SAFETY BELT

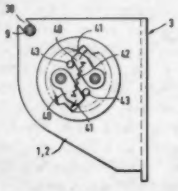
Helmut Seifert, Schwäbisch Gmünd; Wolf-Dieter Höni, Mutlangen; Johannes Schmid, Schwäbisch Gmünd-Hussenhofen, and Bernhard Frei, Waldstetten, all of Fed. Rep. of Germany, assignors to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Division of Ser. No. 48,184, Jun. 13, 1979, Pat. No. 4,277,036. This application Mar. 10, 1981, Ser. No. 242,397

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826286

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A 4 Claims



1. Automatic wind-up roller for a safety belt of a vehicle with means to block a belt shaft on which the safety belt is wound in case of danger, having a housing, a belt shaft rotatably supported in the housing, a safety belt rolled around the belt shaft, a release mechanism which is activated when a predetermined acceleration or deceleration of the vehicle is exceeded, a single control element arranged on the axis of said belt shaft at one end of the belt shaft to normally rotate with the belt shaft, activated by the release mechanism, at least two locking pawls at each end of the belt shaft, connecting means for simultaneously activating all said locking pawls at both ends of the belt shaft by said single control element, locking tooth means at each end of the belt shaft for engagement with the locking pawls, said locking pawls when activated simultaneously interacting with said locking tooth means to block said belt shaft, and means for mounting said two locking pawls on each side of the belt shaft which are operable simultaneously by the control element for movement radially away from the belt shaft axis in opposite directions into the locking position.

---

4,369,933

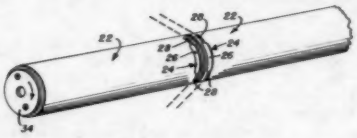
## YARN TUBE WITH PICKUP GROOVE ACCOMMODATING LEFT HAND AND RIGHT HAND PICKUP

William E. Bedenbaugh, Robesonia, Pa., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jan. 13, 1981, Ser. No. 224,689

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—125.1 7 Claims



1. A yarn tube specifically adapted for rotation in opposed directions and yarn pickup in each opposed direction of rotation; said tube being elongated and having an outer yarn receiving surface, a pickup groove in said tube transverse to the length thereof and through said outer surface for receiving and gripping yarn as the tube is rotated, said groove extending continuously about at least a substantial portion of the circumference of the tube, said groove including an elongated wide center section defining a yarn drop-in area capable of receiving a length of yarn, said center section being of a substantially constant width throughout the length thereof and of a substantially greater length than width, said center section terminating in opposite ends, and a pair of elongated gripping sections extending respectively from the opposite ends of said center section to engage and grip yarn upon a relative movement of the yarn from the center section to one or the other of the gripping sections depending upon the direction of rotation of the tube, said groove being of a generally constant depth throughout substantially the entire length thereof.

---

4,369,934

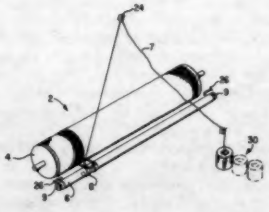
## HELICAL FILAMENT WINDING APPARATUS

Henry J. Spies, P.O. Box 384, Station "B", London, Ontario, Canada (N6A 4W1)

Filed Feb. 3, 1981, Ser. No. 231,584

Int. Cl.³ B65H *54/28, 57/28*

U.S. Cl. 242—157.1 12 Claims



1. A filament guide for use in helical filament winding operations wherein a filament is drawn by a driven form on which

the filament is to be wound, comprising a traction roller having a rotational axis about which, in operation, the filament to be wound is drawn to rotate the roller, the angular contact of the filament with the exterior surface of the traction roller, during operation, being less than $2\pi$ radians; filament contact means contacting the filament to provide axial displacement of an input path of the filament to the traction roller from an output path of the filament from the traction roller by a predetermined amount, whereby the helix angle of wrap of the filament on the form is defined by a force applied in a direction parallel to the rotational axis of the roller by the filament leaving the roller; and means to reverse the direction of the axial displacement of the input and output paths of the filament when the filament contact means reaches predetermined limits, thereby defining the limits of movement of the filament contact means and as well the limits of filament winding on the form.

---

**4,369,935**

## TAPE CASSETTE AND TAPE TRANSPORT MECHANISM

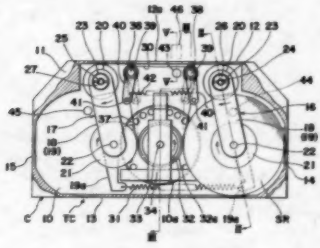
**Takeshi Yamanaka, Otsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Dec. 18, 1980, Ser. No. 217,609**

**Claims priority, application Japan, Dec. 21, 1979, 54-167008; Dec. 21, 1979, 54-167009**

**Int. Cl.³ G03B *1/04*; G11B *15/32***

**U.S. Cl. 242—192** **5 Claims**



1. A tape cassette construction which comprises, in combination:

means defining a support wall of a tape cassette having an operating zone on one side of the support wall;

first and second spaced carriages supported in said operating zone by the support wall for pivotal movement;

hubs rotatably carried by said first and second carriages and wrapped with magnetic recording tape to form rolls of tape carried by the first and second carriages, respectively, each of said hubs being positioned on the corresponding carriage at a point spaced from the point of pivot of the corresponding carriage;

a drive wheel rotatably supported in the operating zone by the support wall and including a coupling means coaxial therewith, said coupling means being adapted to receive a rotational force necessary to rotate the drive wheel;

a biasing means for biasing the first and second carriages in a direction towards each other with said rolls on the hubs held in contact with said drive wheel from opposite directions;

a friction element for each of the first and second carriages operatively mounted to impart a resistance to movement of the corresponding carriage in a direction counter to the direction of pivotal movement of the corresponding carriage;

said friction element comprising a ring-shaped friction piece sandwiched between the corresponding carriage and the support wall and encircling the axis of pivot of the corresponding carriage;

at least one pair of guide poles supported in the operating zone by the support wall for guiding a portion of the magnetic recording tape between the rolls along a predetermined path;

a tensioning device positioned in the operating zone for absorbing any possible slackening of the magnetic recording tape;

said tensioning device comprising a pair of pivotable levers, each lever being rotatably mounted on the corresponding guide pole at right angles thereto and having a tensioning pin carried thereby at the other end thereof, said tensioning pin extending from a corresponding pivotable lever in a direction generally perpendicular to the corresponding pivotable lever and towards the support wall, and

a biasing element for biasing said pivotable levers in a direction towards each other.

---

**4,369,936**

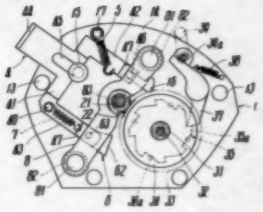
## FISHING REEL CLUTCH CONTROL MECHANISM

**Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan**

**Filed Apr. 1, 1981, Ser. No. 250,035**

**Int. Cl.³ A01K *89/02***

**U.S. Cl. 242—220** **3 Claims**



1. A fishing reel comprising:

a stationary member;

a handle rotatably supported to said stationary member;

a spool having a spool shaft which is rotatably supported to said stationary member;

a transmitting mechanism for transmitting a rotating driving force from said handle to said spool shaft and including a clutch means for selectively interrupting a transmission path in said transmitting mechanism;

a clutch control mechanism for operating said clutch means and comprising: a clutch lever for on-off controlling said clutch means, a pawl swingably supported to a forward end of said clutch lever, means for mounting said clutch lever to said stationary member so as to permit said clutch lever to move forwardly, backwardly and swingably during on-off control of said clutch means, a retaining mechanism for retaining said clutch lever at a forward movement end position thereof, a first spring for biasing said clutch lever in a backward movement direction thereof and in a first swinging direction which permits said clutch lever, when moved forwardly, to swing and be retained by said retaining mechanism at said forward movement end position, and a rotatable return plate having a plurality of protuberances thereon which rotate with said return plate in response to a rotating movement of said transmitting mechanism, said protuberances, when said clutch lever is retained by said retaining mechanism, engaging with said pawl at said clutch lever to swing said clutch lever in a second swinging direction opposite to said first swinging direction to release retainment of said clutch lever by said retaining mechanism, said pawl having a base pivoted to said clutch lever and at its distal end an engaging portion for engaging with a said protuberance, said retaining mechanism including a guide means which allows said clutch lever, when in proximity to the end of its forward movement, to swing under action of said first spring in said first swinging direction to move

said engaging portion of said pawl in a direction of approaching an axis of rotation of said return plate, said clutch lever supporting a second spring for biasing said pawl to a neutral swinging position, whereby if said engaging portion of said pawl engages with a said protuberance as it approaches said axis of rotation during swinging of said clutch lever in said first direction, said pawl rotates against the biasing of said second spring to permit said clutch lever to continue to swing and to be retained by retaining mechanism.

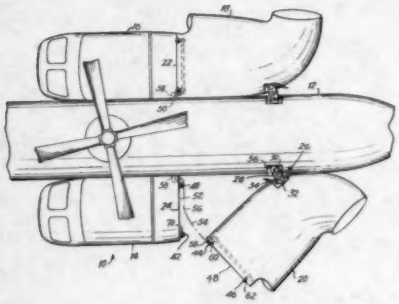
---

**4,369,937**

## HINGING AND LATCHING APPARATUS

**Clarence E. LeBell, Peabody, Mass., and Samuel R. Barr, Sr., deceased, late of Swampscott, Mass. (by Samuel R. Barr, Jr., administrator), assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 18, 1981, Ser. No. 264,268**
**Int. Cl.³ B64D *29/06***
**U.S. Cl. 244—53 R** **12 Claims**



1. Apparatus for mounting an infrared suppressor to an aircraft and for mating a first end of said infrared suppressor to a second end of an engine comprising:

hinge means for attaching said infrared suppressor to said aircraft;

said hinge means including means for supporting and permitting said infrared suppressor to be rotated on an axis away from said second end whereby said second end is made accessible;

said hinge means further including means permitting said first end to be rotated into alignment with said second end and further permitting generally linear translation of said infrared suppressor into mating engagement of said first end with said second end; and

means for maintaining a predetermined minimum spacing of said first end from said second end during rotation of said infrared suppressor into alignment.

---

**4,369,938**

## FUEL TANK FOR MODEL AIRCRAFT

**Robert W. Kress, 27 Mill Rd., Lloyd Harbor, N.Y. 11743**

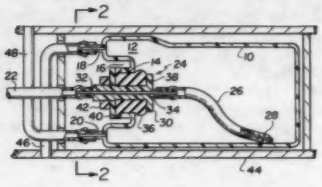
**Filed Nov. 7, 1979, Ser. No. 92,222**
**Int. Cl.³ B64D *37/06***
**U.S. Cl. 244—135 R** **4 Claims**

1. A fuel tank for model aircraft, said tank comprising a hollow body having a top wall, a bottom wall, side walls, and first and second end walls, said fuel tank further comprising:

an aperture for receiving a fuel feed line fitting in the first end wall substantially centrally located between the top and bottom walls, said fuel feed aperture having a substantially horizontal axis parallel to the longitudinal axis of said tank and normal to the planes of said end walls,

a first vent aperture located in the first end wall near the top wall, and a second vent aperture located in the first end wall near the bottom wall, said vent apertures having a substantially horizontal axis parallel to the longitudinal axis of said tank and normal to the planes of said end walls,

said first end wall of said hollow body of said tank having at least one protruding portion extending from side to side



transversely of the longitudinal axis of said tank, said protruding portion forming an extension of the interior of said tank such that the fuel capacity thereof is increased thereby, said fuel line aperture being located rearwardly of said protruding portion.

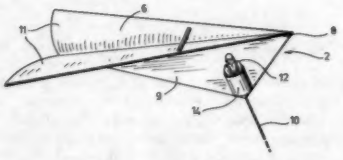
---

**4,369,939**

## ARTICLE DROPPING KITE

**Lloyd C. Elson, 47 Hillyard St., Hamilton, Ontario, Canada (L7L 6B3)**

**Filed Mar. 9, 1981, Ser. No. 241,822**
**Int. Cl.³ B64C *31/06*; A63H *27/08***
**U.S. Cl. 244—155 R** **4 Claims**



1. An article dropping kite comprising:

a kite body;

a kite string connected to the kite body for extension therefrom in a longitudinal flight direction to a kite operator on the ground while the kite is in flight in a flight attitude;

at least one releasable article adapted for releasable carriage by the kite while in the air;

holding means mounted on the kite body for frictionally releasably holding each article on the kite body in any normal flight attitude of the kite, said holding means permitting release of the article only in a direction that is upward against gravity and is at least approximately aligned with the said longitudinal flight direction of the kite string;

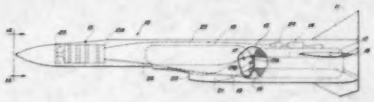
whereby a jerk of sufficient releasable speed and force along the longitudinal direction of the kite string during flight of the kite with a releasable article held thereon releasably overcomes the frictional holding of the article by the holding means under the effect of the inertia of the article for release of the article from the holding means and its subsequent dropping under gravity to the ground.

4,369,940

## AIRBREATHING PROPULSION SYSTEM FOR SUPERSONIC VEHICLES

Patrick J. Kelly, St. Charles, and Gerald T. Arcangeli, St. Louis County, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 17, 1979, Ser. No. 104,289
Int. Cl.³ F42B 15/02
U.S. Cl. 244—3.21 8 Claims



1. In an airbreathing propulsion system for a supersonic vehicle, the improvement which comprises: a body having an air receiving duct formed with a fixed cross-sectional area inlet opening from a side of said body and said duct having a converging throat spaced from said inlet opening and having a lesser cross-sectional area than said inlet opening; a propulsion powerplant communicating with said duct downstream from said converging throat to utilize the air flowing therethrough; and means carried by said body for maneuvering the body into a position for starting said duct, said maneuvering means including a vehicle body guidance means and body flight attitude control means, said guidance means being operative on said control means for positioning said fixed cross-sectional area inlet relative to the airstream flow over said body such that its area presented to the airstream flow is reduced for starting said inlet to supply air for the airbreathing propulsion system.

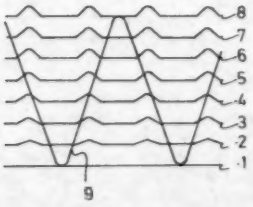
---

4,369,941

## REINFORCING STRIP

Marc Nijs, Moorslede, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Oct. 6, 1980, Ser. No. 194,129
Claims priority, application United Kingdom, Oct. 9, 1979, 7935038
Int. Cl.³ B21F 27/00
U.S. Cl. 245—2 4 Claims



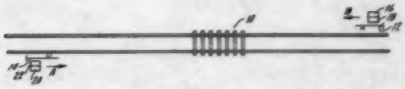

1. A reinforcing strip of wire mesh comprising a plurality of substantially parallel longitudinally extending warp wires, said plurality of warp wires comprising a plurality of incurved portions which provide the strip with a longitudinal low modulus extensibility which increases gradually along the breadth of the strip, adjacent warp wires being connected with transverse wire portions running obliquely from one warp wire to the adjacent one, and welded to these wire portions in the crossing points of said warp wires with said wire portions.

4,369,942

## SIGNAL CONTROL SYSTEM

H. James Wilson, La Grange, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Filed Mar. 19, 1979, Ser. No. 21,695
Int. Cl.³ B61L 21/00
U.S. Cl. 246—34 CT 7 Claims



1. A railroad signaling system including an A transmitter and A receiver for sending and receiving signal messages in one direction and a B transmitter and B receiver for sensing and receiving signal messages in the opposite direction,

said A transmitter and B receiver being located at one end of a signal block and said B transmitter and A receiver being located at the other end,

said A transmitter including means for providing an A type DC message, said B transmitter including means for providing a B type DC message, said A receiver being responsive to only an A type message and said B receiver being responsive to only a B type message, both said A and B type messages including address portions having different pulse characteristics providing directional information,

each of said A and B type receivers including means for inhibiting said B and A type transmitters, respectively, whereby only one transmitter operates at a time.

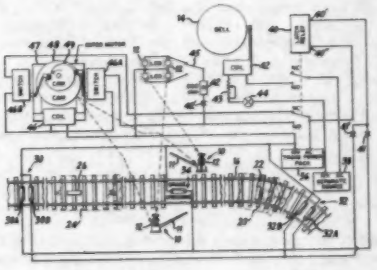
---

4,369,943

## MODEL TRAIN CROSSING GATE

Said Hussein, 2814 Kennedy Blvd., Jersey City, N.J. 07306

Filed Dec. 29, 1980, Ser. No. 220,417
Int. Cl.³ B61L 1/08, 29/22
U.S. Cl. 246—127 18 Claims



1. A model railroad having a train with a locomotive and at least one car traveling along tracks provided with a grade crossing, comprising:

a grade crossing magnetically-operated relay positioned beneath the tracks at the grade crossing and having a particular orientation;

two pairs of adjacent approach magnetically-operated relays positioned beneath the tracks at locations remote from the grade crossing, one pair of approach relays being located on one side of the grade crossing and the other being located on the other side of the grade crossing along the longitudinal extent of the tracks, the orientation of the approach relays being orthogonal to that of the crossing relay;

first and second magnets positioned on the train, the first magnet being located in the locomotive and being ori-

ented to operate the approach relays and the second magnet being located in a last car of the train and being oriented to operate the crossing relay; and

a control circuit for operating the crossing gate so as to lower it whenever the first magnet moves over a pair of approach relays while traveling toward the grade crossing, and raises the gate whenever (i) the second magnet moves over the crossing relay or (ii) the first magnet moves over a pair of approach relays while traveling away from the grade crossing.

---

**4,369,944**

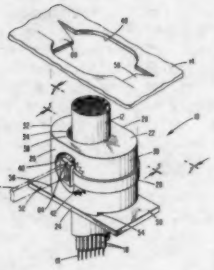
## UNIVERSAL STRAND CLAMP AND STRAND CLAMP ASSEMBLY

**Floyd E. Hobart, Jr., Ironia, N.J., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed Jul. 30, 1980, Ser. No. 173,794**

**Int. Cl.³ F16L *5/00***

**U.S. Cl. 248—56** **14 Claims**



1. A universal clamp member comprising:

a base;

a body portion extending perpendicular from the base;

the body portion and the base having a longitudinally extending passageway formed therethrough for receiving a strand, the body portion also having first and second opposite sidewalls with respective first and second aligned openings extending into the longitudinal passageway, for receiving a strand tie member, the body portion is formed with an inner wall which is offset with respect to the longitudinal passageway for receiving a portion of the strand depressed therein by the strand tie member; and

means adjacent one end of the body portion for securing the clamp member to an associated device.

---

**4,369,945**

## CABLE CLAMPS

**Dominico Mantoan, 5 van der Next Ave., Norkem Park, Kempton Park, Transvaal Province, South Africa, and Mario Morassi, 33020 Ravascletto, Udine, Italy**

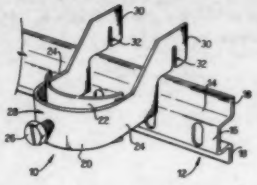
**Filed Oct. 2, 1980, Ser. No. 193,040**

**Claims priority, application South Africa, Oct. 4, 1979, 79/5294**

**Int. Cl.³ F16L *3/08***

**U.S. Cl. 248—73** **7 Claims**

1. In combination with an elongated cross-rung of a cable ladder in which the cross-rung has a forwardly protruding portion and a longitudinally extending flange, a cable clamp for clamping a flexible cable to said cross-rung comprising: a U-shaped bracket having a base and two arms extending rearwardly of said base, each arm having a shoulder for positioning adjacent said forwardly protruding portion and an offset free end portion provided with hook-like formations positioned and shaped to engage said flange; and a saddle element adjustably mounted on the bracket between said arms and positioned to engage a cable interposed between said arms and extending transversely of said cross-rung, whereby adjustment of said saddle element toward the forwardly protruding portion clamps the cable between the saddle element and the forwardly protruding portion, engages the hook-like formations with said flange, and positions the shoulder of each arm adjacent the forwardly protruding portion.



---

**4,369,946**

## CABLE CLIPS

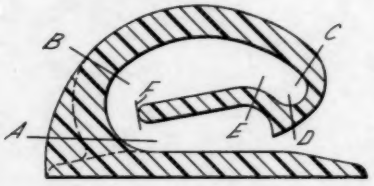
**John P. Palmer, Reading, and Patrick J. McCann, Crowthorne, both of England, assignors to ITW Limited, Windsor, England**

**Filed Jul. 14, 1980, Ser. No. 168,900**

**Claims priority, application United Kingdom, Jul. 14, 1979, 7924595**

**Int. Cl.³ F16L *3/08***

**U.S. Cl. 248—74 A** **5 Claims**



1. A one-piece plastic cable clip comprising a planar base, a resilient arm and a resilient finger, said arm having a first portion extending generally away from the base, a second portion curving and extending in a direction substantially parallel to the base, and a third portion extending from the second portion generally towards the base, said first and second portions being more resistant to bending then said third portion about an axis parallel to the base and transverse to the arm, said arm progressively becoming less resistant to bending along the first and second portions towards said third portion, said resilient finger extending away from said third portion and between said second portion and said base, said third portion being adapted to permit said finger to engage said second portion and cooperate therewith when the clip is used to position a larger size of cable, a portion of the finger proximate to the third portion including a tooth protruding generally towards said base, said tooth being substantially thicker than the third portion and the finger and being substantially inflexible, said finger including a portion which is less resistant to bending than said first and second portions wherein said tooth is disposed between the less resistant to bending finger and third portion, said base including a sloping edge surface forming a lead-in, said sloping edge of said planar base cooperating with the resiliency of said arm and said finger to facilitate insertion of a cable into the clip whereby a cable is securely retained in the clip by the cooperation of the resilient finger and arm, the substantially rigid tooth, and the base.

## 4,369,947
## WIRE HARNESS FIXING ASSEMBLY

**Fumiyoshi Kuwano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Nov. 7, 1980, Ser. No. 204,805**
**Claims priority, application Japan, Nov. 8, 1979, 54-154193[U]**
**Int. Cl.³ F16L 3/08**
**U.S. Cl. 248—74 A** **14 Claims**

1. A device for retaining an elongated object against a substantially flat support or workpiece, comprising:

a first post member projecting upwardly from said support or workpiece and having an axially extending inner bore;

a second post member projecting from said support or workpiece and spaced apart from said first post member to define a space therebetween for receiving therein the elongated object;

a retaining member separate from the first and second post members and having an elongated strip portion being longitudinally positionable to extend between said first and second post members above the space to retain the elongated object within said space immediately adjacent the support, said retaining member further including a pin portion projecting from said strip portion and being insertable into said bore; and

clip means for retaining said pin portion within said bore;

said first post member including an outer shape having a substantially flat wall portion with a pair of rounded edges, and a cylindrical wall portion;

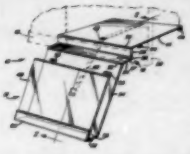
said retaining member further including a resilient bent portion extendedly provided at one end of said strip portion and a lug portion extending from one end of said bent portion in substantially the same direction as said pin portion, said lug portion being engageable with the flat wall portion to prevent the strip portion from rotating about the pin portion to maintain the strip portion in a first operative position extending longitudinally between said first and second post members to retain the object in said space, said resilient bent portion being flexible to allow said lug portion to move around one of the rounded edges, enabling said strip portion to move into a second operative position whereby said elongated object can be removed or positioned within said space.

## 4,369,948
## DISAPPEARING BOOK HOLDER

**Leonard Krauss, and Halina Krauss, both of 4204 Melisa Ct., Carmichael, Calif. 95608**

**Filed May 7, 1980, Ser. No. 147,377**
**Int. Cl.³ A47B 63/06, 77/10**
**U.S. Cl. 248—441 A** **3 Claims**

1. A book holder able to support a book in a substantially vertical orientation comprising means to attach said book holder to a support surface, book support means pivotally mounted on said attachment means for supporting said book in said substantially vertical orientation positioned below and forward of said surface, means to lock said book support means in at least one of a plurality of inclined positions below and forward of said surface, said book support means including a book back support and a book shelf attached to a lower end of said back support and said means to lock said book support means including an adjustable support arm pivotally mounted on said attachment means and able to engage one of a plurality of extensions placed on the surface of said back support, said attachment means being capable of securing the book holder underneath said support surface, said book support means being pivotal about said attachment means to a horizontal position adjacent and below said surface, said attachment means further including a retaining means to lock said book



support means in said horizontal position, said book support means being pivotal about said attachment means by a double hinge plate attachment which supports said book support means in said substantially vertical orientation and which is able to be folded underneath and adjacent said support surface when said book support means is in said horizontal position.

## 4,369,949
## LOUDSPEAKER PEDESTAL

**David E. Zopf, Lansing, Mich., assignor to CBS Industries, Lansing, Mich.**

**Filed May 27, 1980, Ser. No. 153,189**
**Int. Cl.³ F16M 13/00**
**U.S. Cl. 248—632** **5 Claims**

1. A speaker support for elevating, inclining and vibration isolating a loudspeaker in relation to a floor surface comprising:

a roughly box-shaped, rigid hollow base structure for elevating a loudspeaker placed thereupon, said base structure having a top surface and downwardly extending sides terminating in bottom edges;

a continuous layer of self-skinning, semi-rigid urethane foam molded over and encasing said box-shaped rigid base structure for vibration isolating a loudspeaker;

a floor-engaging surface disposed on said support;

a speaker-engaging surface disposed on said support above said floor-engaging surface, said speaker-engaging surface being inclined downwardly from front-to-back with respect to said floor-engaging surface for inclining a loudspeaker;

a speaker-engaging stop disposed at the back of said speaker-engaging surface, said stop extending above said speaker-engaging surface to prevent a loudspeaker from sliding therefrom; and

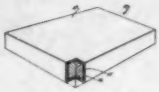
said foam layer extending continuously over the entire top surface of said base structure, downwardly over the exterior of the sides of said base structure, inwardly over the bottom edges of said base structure and over said stop, said floor-engaging surface being formed by said foam layer overlying the bottom edges of said base structure, said speaker-engaging surface being substantially imperforate and formed by said foam layer overlying the entire top surface of said base structure and atop said base structure, whereby vibration from a speaker disposed on said support, or from a surface upon which the support is positioned is effectively dampened by a foam layer engaging both the speaker and the floor surface upon which it rests while extending continuously therebetween.

**4,369,950**

## TURNTABLE SUPPORT

**David E. Zopf, Lansing, Mich., assignor to Complete Business Services Corp., Lansing, Mich.**

**Filed May 27, 1980, Ser. No. 153,453**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—632** **4 Claims**



1. A turntable support for vibration isolating, elevating and leveling a turntable in relation to a resting surface comprising:

a roughly rectangular rigid base structure for elevating a turntable, said base having a top surface, sides and bottom edges;

a continuous layer of self-skinning, semi-rigid urethane foam molded onto and fully encapsulating said rectangular base structure for vibration isolating a turntable;

a turntable engaging surface disposed on said support;

a plurality of resting surface engaging feet, said feet each including means for selectively adjusting the length of said feet for leveling a turntable; and

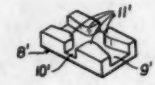
said foam layer extending continuously over the entire top surface of said base structure, downwardly over the exterior of the sides of said base structure, inwardly over the bottom edges of said base structure and between said base structure and said feet, said turntable engaging surface being formed by said foam layer, said turntable engaging surface being substantially imperforate and formed by said foam overlying the entire top surface of said base structure, whereby vibration from a turntable or from a surface upon which the turntable support is positioned is effectively dampened by a foam layer engaging both the turntable and the feet of the turntable support while extending continuous therebetween.

**4,369,951**

## SQUEEZED TUBE VALVE

**Hermann Marsoner, Graz, and Erich Kleinhappl, Kumberg, both of Austria, assignors to Hans List, Graz, Austria**

**Filed Aug. 5, 1981, Ser. No. 290,213**
**Claims priority, application Austria, Aug. 11, 1980, 4119/80**
**Int. Cl.³ F16L *55/14***
**U.S. Cl. 251—7** **3 Claims**



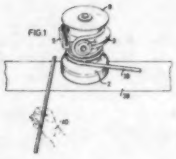

1. A squeezed tube valve comprising, an electromagnetically actuated clamping bolt and a valve block, said valve block having a longitudinally extending groove of essentially U-shaped cross-section for the reception of a flexible tube therein along said groove, said valve block also having a transversely extending groove of approximately the same depth as said longitudinal groove for the reception upon actuation of said clamping bolt which lies transverse to said longitudinal groove, said longitudinally extending groove and said transversely extending groove each being defined by a bottom portion and two side walls, said grooves intersecting and presenting edges which are rounded off, the location of intersection of said grooves defining a squeeze zone, said edges bounding said squeeze zone and being defined by the intersection of said side walls of the respective longitudinally extending and transversely extending grooves, said edges having radii corresponding at least approximately with the tube radius, and said clamping bolt being actuated for shutting off the tube by squeezing in such a manner that the shutting force exerted by the bolt on the tube rises from zero according to an asymptotic rise function over the duration of the shutting action, whereby the tube during the shutting process is permitted to yield in said squeeze zone by expanding on opposite sides into both said grooves thus avoiding undue strain on the tube at said zone.

**4,369,952**

## MANUALLY DRIVEN WINCH

**Lennart Kurling, Bergärkan 81, 421 69 Västra Frölunda, Sweden**

**Filed Feb. 10, 1981, Ser. No. 233,205**
**Claims priority, application Sweden, Feb. 11, 1980, 8001056**
**Int. Cl.³ B66D *1/22, 1/30, 1/78***
**U.S. Cl. 254—353** **10 Claims**




1. Manually driven winch, comprising a frame and a winch drum carried by the frame and rotatable in one direction, characterized by a support means arranged coaxial to the winch drum and provided with a pulley, means mounting said support means for rotation relative to the frame between first and second end positions which are angularly spaced apart, an additional drum arranged coaxial to the winch drum, a ratchet latch drivingly interconnecting the support means or the additional drum with the winch drum to drive the winch drum as the support means is rotated from the first to the second end position by a pulling movement of the outgoing portion of a line which is pulled around the winch drum over the pulley and around the additional drum in a direction opposite the direction of the line around the winch drum, and means to return the support means to the first end position after turning the support member from the first to the second end position.

**4,369,953**

## FENCE CONSTRUCTIONS AND IN FENCE ELEMENTS THEREFOR

**Waldemar H. Greiner, 11 Harrisford St., Unit 55, Hamilton, Canada (L8K 6L7), and Denis P. Muscat-Tyler, 5134 Mulberry Dr., Burlington, Canada (L7L 3P4)**

**Filed Feb. 27, 1981, Ser. No. 238,897**
**Claims priority, application Canada, Dec. 3, 1980, 366083**
**Int. Cl.³ E04H *17/16;* E04N *17/14***
**U.S. Cl. 256—24** **31 Claims**

1. A post/rail element for a fence construction comprising an elongated hollow member of part-octagonal transverse cross-section having:

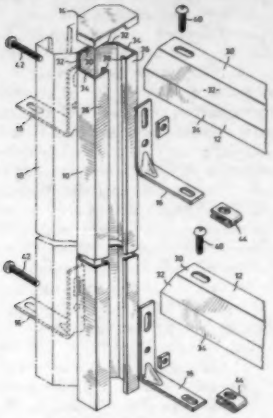
an elongated base wall, two elongated intermediate walls, two elongated side walls parallel to one another, two elongated flange walls coplanar with one another, and two elongated spaced returned walls parallel with one another;

respective longitudinal edges of the two intermediate walls having respective parallel junctions with the two longitudinal edges of the base wall;

two respective longitudinal edges of the two parallel side walls having respective parallel junctions with the other two edges of the intermediate walls;

two respective longitudinal edges of the two coplanar flange

walls having respective parallel junctions with the other two edges of the side walls, and



two respective longitudinal edges of the two parallel returned walls having respective parallel junctions with the other two edges of the flange walls.

---

4,369,954

## REGENERATIVE AIR PREHEATER WITH IMPROVED INSULATION BETWEEN COMBUSTION CHAMBER AND CHECKER SHAFT

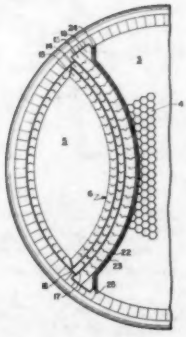
Helmut Palz, Wiesbaden, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,198

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929718

Int. Cl.³ C21B 9/02

U.S. Cl. 266—139 10 Claims



1. In a regenerative air preheater of the type including a masonry casing having therein a combustion chamber and a checker shaft set with checker bricks, and a separating wall between said combustion chamber and said checker shaft, the improvement of insulation means between said combustion chamber and said checker shaft, wherein said insulation means comprises:

a space between said separating wall and said checker bricks;

insulating material comprising fireproof fiber material positioned within said space; and

said insulating material being structurally free of said separating wall.

4,369,955

## CUPOLA FURNACE SYSTEM

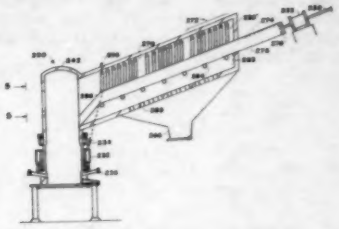
Ki D. Park, 1424-3 3Ku Sankyuk Dong, Buk-Ku, Taegu, Rep. of Korea

Filed Nov. 10, 1980, Ser. No. 205,306

Claims priority, application Rep. of Korea, Jun. 25, 1980, 80-2495

Int. Cl.³ F27B 1/22

U.S. Cl. 266—139 5 Claims



1. In a system having: upright cupola cylindrical shell structure defining a melting chamber for melting pig iron by direct contact in a charge with burning fuel, means for charging pig iron and coke and flux into the melting chamber, means for charging compressed air into the burning fuel inwardly through the lower portion of the melting chamber, and an upright stack having connection for carrying away hot gases from said burning, the improvement comprising in combination: means for preheating said compressed air, pig iron, coke and flux to be charged into the melting chamber, including: a preheating furnace laterally connecting the upright cylindrical shell structure and upright stack, means for directing said hot gases through the preheating furnace, respective portions of the means for charging compressed air and of the means for charging pig iron, coke and flux passing through the preheating furnace for preheating said compressed air, pig iron, coke and flux, the means for directing comprising a cover closing the upper end of said cylindrical shell structure, the cover having a lower face in the form of a concave reflector coaxial with said cylindrical shell structure for concentrating heat reflected therefrom onto said charge in the melting chamber, the preheating furnace having overhead, bottom and sides rising in incline from an angle of the lower end at the cylindrical shell to a closed upper end proximate said stack, whereby said hot gases take a change in direction, and the preheating furnace venting to the stack on a said side of the preheating furnace and proximate said upper end.

---

4,369,956

## SELF-CENTERING FIXTURE

Orvil R. Aronson, 620 N. Riverside, St. Clair, Mich. 48079

Filed Nov. 17, 1980, Ser. No. 207,286

Int. Cl.³ B23Q 3/08

U.S. Cl. 269—34 2 Claims

1. A self-centering fixture comprising, in combination:

a base;

a pair of levers disposed substantially parallel to each other and pivoted to said base, each lever providing two arms of unequal length;

a jaw mounted on the shorter arm of each lever with the jaws facing each other between the levers to cooperatively clamp an article therebetween;

a rotary motor mounted on an upstanding portion of the base and having a rotary shaft extending beyond opposite ends of the motor and perpendicular to the plane of movement of the levers with one end of the shaft extending between the ends of the longer arms of the pair of levers and the other end of the shaft disposed remote from the levers but adjacent an upstanding portion of the base;

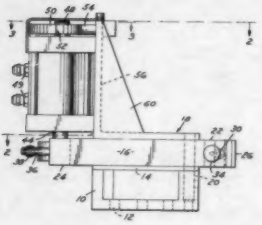
a rotary cam on said one end of the shaft to bear against the

ends of the longer arms of the pair of levers and having a pair of diammetrically opposite high lobes and a pair of diammetrically opposite low lobes angularly displaced from the high lobes;

spring means for urging the arms against the lobes of the cam;

a rotary stop member mounted on said other end of the shaft and having a pair of stop faces angularly spaced apart similar to the angular displacement of the high and low lobes;

a stop pin mounted on the base adjacent the rotary stop member for engaging said stop faces to limit rotation of the shaft for stopping the same when the high and low lobes confront the levers;



said cam when rotated to bring the high lobes toward the levers causing the jaws to clamp an article therebetween and when rotated to bring the low lobe toward the levers causing an unclamping thereof;

each jaw having a key and each end of the shorter arm having a key way to receive the key; and

a dowel pin extending between each jaw and the end of its respective arm disposed perpendicular to the direction of the key and key way, and a threaded fastener for each jaw extending substantially parallel to the dowel pin and engaging the jaw and respective end of the arm to retain the same against unintended separation.

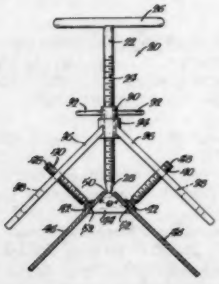
---

**4,369,957**

## DEVICE FOR CLAMPING AND ALIGNING PLATES TO BE JOINED IN SELECTED ANGULAR RELATIONSHIP

**Stanley B. Williams, 2088 E. Empire, Lot 151, Benton Harbor, Mich. 49022**

**Filed Aug. 3, 1981, Ser. No. 289,765**
**Int. Cl.³ B23Q *1/00***
**U.S. Cl. 269—41** **7 Claims**



1. A device for clamping a pair of plates in closely spaced edge to edge and angularly aligned but not coplanar relationship so that the plates may be joined along their edges by welding or the like, comprising first clamp means engageable with inner surfaces of the plates to opposite sides of an inside corner defined when adjacent edges of the plates are in closely spaced relationship; second clamp means engageable with outer surfaces of the plates generally opposite from the first clamp means when the plates are in the closely spaced relationship; and means for moving said first and second clamp means toward and away from each other to grip the plates therebetween, to hold the plates in position for joining along their adjacent edges and to release the plates for removal of the device therefrom, said first and second clamp means being configured to move the plates to and to hold the plates in a selected angular relationship when the same are moved together and grip the plates, wherein said first clamp means is relatively thin for insertion and removal thereof into and from the inside corner of the plates through the space between adjacent edges of the plates when the plane of said first clamp means extends along the length of the space, and for engagement of the plate inner surfaces to opposite sides of the inside corner when the plane thereof extends generally perpendicular to the length of the space, said first clamp means being triangular shaped, having two side edges and engaging the plates along said side edges, the included angle between said two side edges determining the angular relationship of the plates when clamped, and wherein said second clamp means is movable against said plates in directions generally perpendicular to respective ones of said first clamp means side edges.

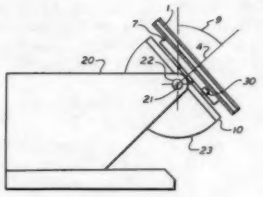
---

**4,369,958**

## ROTATING TABLE POSITIONING DEVICE WITH MINIMUM BACKLASH

**Robert A. Maynard, Holland, N.Y., assignor to Airco, Inc., Montvale, N.J.**

**Filed Nov. 17, 1980, Ser. No. 207,572**
**Int. Cl.³ B23Q *3/18***
**U.S. Cl. 269—61** **10 Claims**



1. A positioning device for rotating an eccentrically mounted load comprising:

(a) a frame;

(b) a table supported by the frame and mounted for rotation about an axis;

(c) a bullgear fixed to the table for rotating the table;

(d) first and second pinions engaging the bullgear;

(e) a first gear set coupled to the first pinion and comprising a first worm and first gear wherein the first gear is capable of driving the first worm and the first worm is capable of driving the first gear;

(f) a second gear set coupled to the second pinion and comprising a second worm and second gear wherein the second gear is capable of driving the second worm and the second worm is capable of driving the second gear;

(g) a coupling shaft;

(h) an adjustable coupling; wherein the first gear set, the coupling shaft, the adjustable coupling and the second gear set are coupled so that the coupling shaft is under torsion which drives the first and second pinions so as to tend to rotate the bullgear in opposite directions;

(i) a third gear set comprising a self-locking third worm and third gear wherein the third gear is coupled to the coupling shaft;

(j) a motor for selectively rotating the third worm and thereby rotating the table.

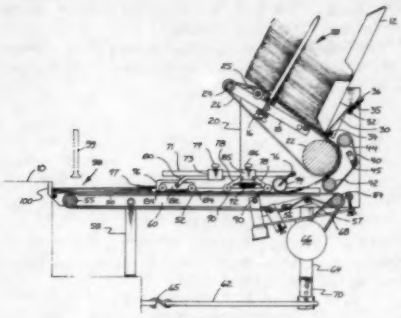
## 4,369,959
## SHEET FEED MACHINE

William M. Hornbuckle, 7080 Stonington Dr., NE., Atlanta, Ga. 30328

Continuation of Ser. No. 93,305, Nov. 10, 1979, abandoned, which is a continuation of Ser. No. 891,018, Mar. 28, 1978, abandoned. This application May 26, 1981, Ser. No. 267,008

Int. Cl.³ B65H *1/30, 1/04, 3/04*

U.S. Cl. 271—3.1 15 Claims



1. An improved sheet material processing apparatus for feeding successive sheets of said sheet material to a printer of the type having a suction arm over a printer elevator of said printer, said suction arm removing successive top sheets from a stack of sheets therebelow, said apparatus comprising, in combination:

(a) a portable self contained frame supporting structure including an upstanding stanchion member with its lower end adapted to be supported on the floor which supports said printer, a frame having an input end and an output end, said frame being mounted to the upper end of said stanchion member by its input end, said frame protruding in cantilever fashion from said stanchion member, said stanchion member supporting said frame at a height such that the output end will protrude into a position vertically between said elevator and said suction arm and said input end is vertically outwardly of said printer when said stanchion member is positioned on the floor adjacent to the end of said printer;

(b) a sheet material input station spaced from said output end and mounted on said input end of said frame, with said input station detailed to permit sheet material being processed to be successively added to one portion of said input station while being simultaneously removed from another portion of said station;

(c) a sheet material output station mounted on said output end of said frame, with said output station detailed to permit sheet material being processed to produce a stack of sheets such sheet material at said output station and below said suction arm and also to permit successive sheets of said sheet material to be progressively fed to the bottom of the stack of sheets of sheet material and for permitting said suction arm to successively remove the topmost sheet from said stack of sheet material at said output station while sheets of said sheet material are being simultaneously added to the bottom of said stack in said output station;

(d) sheet material transfer means supported on said frame and operable for effecting a transfer of sheets of said sheet material from said other portion of said input station to said output station for progressively replenishing said stack;

(e) control means on said frame structure operable for sensing a predetermined accumulation of sheets of said sheet material in said output station and operable for initiating operation of said transfer means when the sheet accumulation in said stack drops below a predetermined amount and stopping operation of said transfer means in response to the accumulation of a predetermined amount; and

(f) means for removeably securing said apparatus to the end of said printer in a position in which said output station is disposed below said suction arm and over said printer elevator.

---

## 4,369,960
## DEVICE FOR SEPARATING BANK NOTES

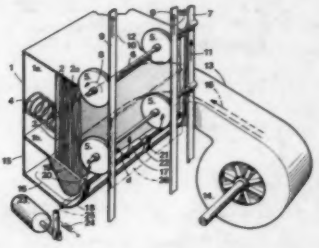
Marcel Brisebarre, Thoiry, France, assignor to ATS Advanced Technics & Systems, S.A., Lausanne, Switzerland

Filed Oct. 20, 1980, Ser. No. 198,797

Claims priority, application Switzerland, Nov. 1, 1979, 9821/79

Int. Cl.³ B65H *3/14*

U.S. Cl. 271—5 12 Claims



1. A device for separating bank notes from a pile having an outermost note defining a plane comprising at least one air jet disposed adjoining one edge of said outermost note and in spaced relationship to the side of said plane away from said pile and directing the air emanating therefrom in a diverging direction in relation to the plane of said outermost note to produce a reduced pressure, in a first phase, on the front face of the last said note which removes an edge portion thereof until this edge enters said jet, whereby said jet may act, in a second phase, by pressure on the opposite face of the note to detach it from the pile and simultaneously to hold the following note applied against said pile.

---

## 4,369,961
## APPARATUS FOR WITHDRAWING FLAT CARTON BLANKS FROM A STACK THEREOF

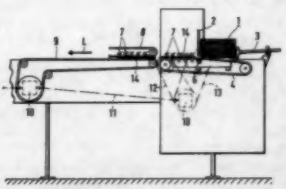
Helmut Gopel, Dusseldorf, and Hartmut Klapp, Kaarst, both of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 7, 1980, Ser. No. 205,046

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946426

Int. Cl.³ B65H *3/04*

U.S. Cl. 271—10 12 Claims



1. In an apparatus for the withdrawal of flat carton blanks made of paperboard, boxboard or corrugated board from a stack and having guide means on which the stack is disposed,

retaining means immediately downstream of the stack, a takeoff conveyor with at least one conveyor belt disposed beneath the stack of blanks for the controlled withdrawal of the lowermost blank and a conveyor disposed directly downstream of the takeoff conveyor and driven in synchronism therewith for the onward transportation of the individually withdrawn blanks, the improvement wherein the guide means supports the lowermost blank in a given plane, the takeoff conveyor has means mounting a run of the at least one belt under the stack to dispose same downwardly at an acute angle relative to the given plane with the uppermost portion starting at the leading edge of the lowermost blank in the vicinity of the retaining means and means disposed below said at least one conveyor belt for periodically lifting a portion thereof disposed below said retaining means to effect engagement of the belt with only the lowermost blank and only upon the lifting of the belt.

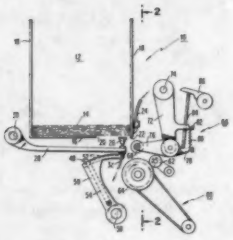
---

**4,369,962**

## APPARATUS FOR FEEDING SHEETS

**Murray Spiro, 35-7 Fairfieldway, Commack, N.Y. 11725**

**Filed Feb. 17, 1981, Ser. No. 234,691**
**Int. Cl.³ B65H *3/08***
**U.S. Cl. 271—11** **5 Claims**



1. An apparatus for feeding a single sheet from the bottom of a stack of sheets comprising:

a magazine to receive a stack of sheets having a bottom support and upstanding walls, the bottom support being provided with an opening therein through which the lowermost sheet can be removed, wherein the opening is along one edge of the stack of sheets;

at least one suction nozzle below the magazine opening which retracts downward when engaging the sheet;

a means for blowing compressed air along a portion of the edge and bottom of the stack of sheets to separate the edge of the lowermost sheets from the stack prior to contact with the suction nozzle;

at least one curved vacuum surface below the magazine and the suction nozzle;

a first pivot arm attached to the suction nozzle;

a second pivot arm attached to the vacuum surface;

a sheet receiving and feeding means adjacent and below the magazine for receiving and feeding the sheet to a station for performing subsequent operations thereon;

a first activation means for pivoting the first pivot arm to (i) raise the suction nozzle to engage the bottom surface of the lowermost sheet and subsequently (ii) lowering the suction nozzle to engage the bottom surface of the sheet with the vacuum surface;

a second activation means for pivoting the second pivot arm to (i) move the vacuum surface towards the receiving and feeding means for receipt of the sheet, and (ii) return the vacuum surface to the position below the suction nozzle and magazine;

a first vacuum means for applying vacuum to the suction nozzle;

a second vacuum means for applying vacuum to the vacuum surface;

wherein the suction nozzle comprises:

a hollow elongated member having an open upper end and a closed lower end, the member being mounted near the end of the first pivot arm;

a piston member slidably and sealingly mounted within the chamber of the member;

a spring retaining means below the piston member for retaining the piston member at the upper end of the chamber;

a sucker attached to the piston member, the center of which is in fluid communication with the chamber below the piston member; and

wherein the first vacuum means applies vacuum to the chamber below the piston member;

whereby when the sheet engages the sucker a vacuum forms in the chamber below the piston member causing the sucker to retract downward.

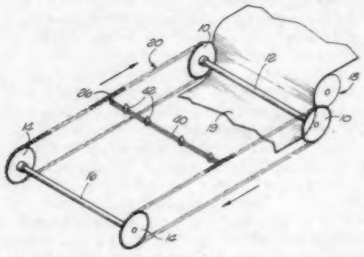
---

**4,369,963**

## CLIP-ON STAR WHEEL SUBSTITUTE

**H. William Jamieson, Jr., Encino, Calif., assignor to Offset Engineering Co., Inc., Encino, Calif.**

**Filed Dec. 17, 1979, Ser. No. 104,500**
**Int. Cl.³ B65G *29/00***
**U.S. Cl. 271—204** **5 Claims**



1. In the chain delivery of a printing apparatus having a pair of continuous chains, upon which chains are mounted a plurality of paper gripping members, and wherein the continuous chains include a plurality of pairs of links each pivotally connected by a pintle, the improvement in the means for engaging the paper as it passes into the chain delivery, which engaging occurs between the paper gripping members and prevents wrinkling of the paper, comprising:

a pair of opposing clips, each detachably mountable on one of the links of each of the chains, and including a support;

a bar, having a longitudinal axis, with hollow portions at each end defined by a plurality of inner surfaces, said bar being fixedly engaged by said support, each support having a plurality of outer surfaces corresponding to the plurality of inner surfaces of the hollow bar portion, and fixedly engaging the outer surfaces of the support, thereby preventing rotation of said bar about its longitudinal axis; and

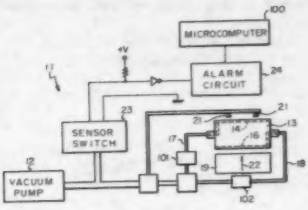
at least one paper contacting member longitudinally adjustably mounted on said bar, said member having an eccentric shape and a bearing surface at the apex of the eccentric shape, and said member being rotatably adjustable about said longitudinal axis, and having an internal opening in the eccentric containing a plurality of teeth coming into contact with the plurality of sides of said bar which define a plurality of corners, said teeth fixedly engaging at least one of the corners and holding the eccentric at a predetermined the operation of the chain delivery.

4,369,964

## SHEET FEED APPARATUS FOR PRINTER OR THE LIKE

Koichiro Jinnai, and Michio Umezawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 219,757
Claims priority, application Japan, Dec. 31, 1979, 54-171094; Dec. 31, 1979, 54-171095
Int. Cl.³ B65H 7/06, 7/20
U.S. Cl. 271—260 4 Claims




1. A sheet feed apparatus including a drum formed with openings, a vacuum source communicating with the openings so that a sheet is suckingly adhered to the drum by vacuum at the openings, means for feeding the sheet to the drum and means for feeding the sheet away from the drum, characterized by comprising:

sensor means for sensing when a level of vacuum at the source drops below a predetermined value and producing an output signal in response thereto;

valve means disposed between the vacuum source and the openings;

means responsive to the sensor means for, when the output signal is produced during feeding of the sheet to the drum, deenergizing the apparatus; and when the output signal is produced during feeding of the sheet away from the drum, resetting the apparatus to an initial condition with the valve means closed; and

an alarm which is energized by the output signal.

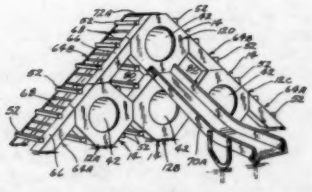
---

4,369,965

## PLAYGROUND CLIMBER AND SLIDE

Paul W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Oct. 9, 1980, Ser. No. 195,671
Int. Cl.³ A63B 9/00
U.S. Cl. 272—56.5 R 33 Claims



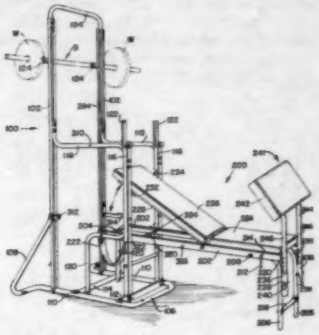
1. An end piece for a playground climber, said end piece being adapted to be vertically disposed and having a center axial horizontal opening and a radially extending flange terminating in a rim having eight flat end-to-end surfaces including two oppositely disposed vertical surfaces, two oppositely disposed horizontal surfaces and two pairs of oppositely disposed diagonal surfaces, said vertical and horizontal surfaces being parallel to said horizontal axial opening and said diagonal surfaces being flared outwardly thereto to present a step mounting edge.

4,369,966

## FOLDING EXERCISING APPARATUS

Ira J. Silberman, and Calvin E. James, Sr., both of Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Continuation-in-part of Ser. No. 12,487, Feb. 15, 1979, Pat. No. 4,316,609. This application Mar. 7, 1980, Ser. No. 128,084
Int. Cl.³ A63B 21/00
U.S. Cl. 272—62 7 Claims



1. A free-standing exercising apparatus comprising:

a floor-supported chinning bar assembly having upstanding frame means; and

an exercising bench having an elongated bench frame and a seat supported on said bench frame, said bench frame being pivotally attached near one of its ends to said frame means for pivotal movement between a laterally extended use position for supporting a user on said seat and an upright, compact storage position juxtaposed with said frame means,

said frame means comprising:

a bottom floor-engaging base portion adapted to stably support the apparatus without additional support above said base portion;

two upright barbell support posts flanking said bench near its pivoted end, each of said barbell support posts terminating at its upper end in a barbell rest cradle; and

an overhead chinning bar rigidly supported near the upper portion of said frame means.

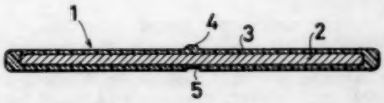
---

4,369,967

## TRAINING AID FOR DRILLING MUSCLES

Akira Kimura, 1-25, Takenotsuka 3-chome, Adachi-ku, Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 249,596
Claims priority, application Japan, Dec. 29, 1980, 55-190040[U]
Int. Cl.³ A63B 21/18
U.S. Cl. 272—119 1 Claim




1. A training aid for drilling muscles of a user comprising:

a flexible plate made of lead; and

a cover member made of soft and resilient material such as rubber and synthetic resin and completely surrounding the plate;

at least one projection formed integrally with the cover member on one main surface of the training aid and at least

one recess formed in the cover member on the other main surface of the training aid whereby a plurality of training aids are piled one over another and the training aid is mounted around a user's part such as wrist, ankle, arm, leg and neck merely be bending the lead plate.

---

**4,369,968**

## LIFTING BAR ASSEMBLY

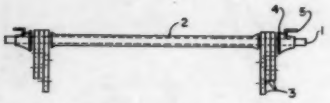
**Paul J. Price, 1420 Junior Dr., Pittsburgh, Pa. 15227**

**Filed Feb. 5, 1981, Ser. No. 231,933**

**The portion of the term of this patent subsequent to Feb. 24, 1998, has been disclaimed.**

**Int. Cl.³ A63B** *13/00*

**U.S. Cl. 272—123** **3 Claims**



**1.** A lifting bar assembly comprising an elongated solid cylindrical rod, a tube telescopically slid over said rod over an intermediate portion of its length, a plurality of weight discs abutting each end of said tube, each disc having a central hole and at least one hole adjacent the periphery of said disc, both said holes being sized to receive said rod, said rod extending through each of the holes adjacent the periphery of said discs so that most of the area of said discs extends downwardly of said rod therefore will enable the assembly to be lifted to a greater height without bumping against a low ceiling, and a collar slidably mounted on each end portion of said rod and having means for rigidly fastening it to said rod.

---

**4,369,969**

## BODY EXERCISING DEVICE

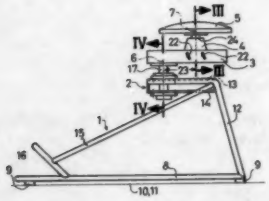
**Willy Straub, Nellingen, Fed. Rep. of Germany, assignor to Georg Kirchner, Markgroeningen, Fed. Rep. of Germany**

**Filed Mar. 13, 1981, Ser. No. 243,343**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011208**

**Int. Cl.³ A63B** *21/00*

**U.S. Cl. 272—144** **22 Claims**



**1.** A body exercising device, comprising a support; a bracket element arranged on said support rotatable about a first axis; and a user supporting element arranged on said bracket element eccentrically rotatable about a second axis, said user supporting element being plate-shaped and formed as a seat for a user, and said bracket element and user supporting element being arranged so that said first and second axes extend in a substantially vertical direction and are spaced from one another by a predetermined ajustable distance, and said user supporting element being movable relative to said bracket element between a first position in which said second axis of said user supporting element is parallel to said first axis of said bracket element and a second position in which said second axis of said user supporting element is spaced from and inclined relative to said first axis of said bracket element; means for adjusting the distance between said axes of said bracket element and said user supporting element; and means for adjusting an angle between the axis of said user supporting element and the axis of said bracket element.

---

**4,369,970**

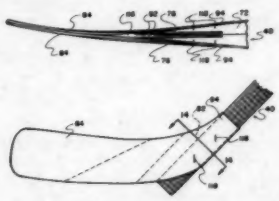
## HOCKEY STICK AND METHOD OF MANUFACTURING THE SAME

**Reijo K. Salminen, 1842 Academy Rd., Bellingham, Wash. 98225**

**Filed Jul. 10, 1979, Ser. No. 56,421**

**Int. Cl.³ A63B** *59/12*

**U.S. Cl. 273—67 A** **39 Claims**



**1.** A method of making a hockey stick, said method comprising:

a. forming a shaft with an end taper, said shaft having a longitudinal axis, a bladewise axis, and a transverse axis perpendicular to the longitudinal axis and the bladewise axis, said shaft having a core portion and two side surface portions positioned generally parallel to the bladewise axis and the longitudinal axis, said shaft having an upper end portion and a lower end portion, said taper being formed at said lower end portion in a manner that said side surface portions converge downwardly and inwardly along said lower end portion to a location proximate a lower end of said shaft,

b. providing two blade blanks, said blanks each having a front toe portion and a rear portion, joining the toe portions to one another and attaching the rear portions to the shaft in a manner that the blade blanks diverge rearwardly from one another to provide an interior blade space therebetween, and

c. filling said interior blade space at least partially with a hardenable filler material to form a finished hockey stick.

**19.** A hockey stick comprising:

(a) an elongate shaft having a longitudinal axis, a bladewise axis, and a transverse axis perpendicular to the longitudinal axis and the bladewise axis, said shaft having a core portion and two side surface portions positioned generally parallel to the bladewise axis and to the longitudinal axis, said two side surface portions being load bearing portions to resist bending of the shaft about the bladewise axis,

(b) said shaft having an upper end portion and a lower end portion, said lower end portion tapering downwardly and inwardly toward said bladewise axis, with the side surface portions extending downwardly and inwardly along the lower end portion of the shaft,

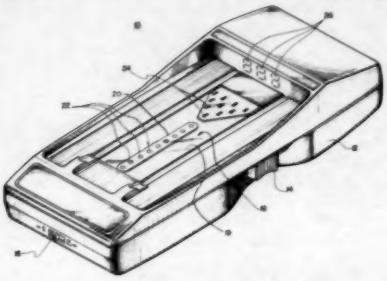
(c) a blade having a front toe portion and a rear heel portion joining to said shaft, said blade comprising two blade surface portions joining to one another at said toe portion and diverging rearwardly from one another to join to said lower shaft lower end portion, and

(d) said blade having a hardened filler material occupying a space between the two blade surface portions, said filler material having a cross sectional dimension occupying a substantial portion of the thickness of said blade.

## 4,369,971
## ELECTRONIC BOWLING GAME

Richard S. Chang, Rolling Hills Est., and Richard S. Levine, Huntington Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 7, 1981, Ser. No. 223,185
Int. Cl.³ A63F 7/06
U.S. Cl. 273—85 G 7 Claims



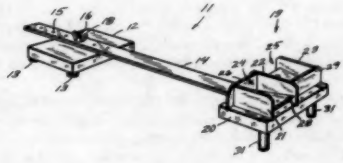
1. An electronic game comprising means for providing indicia of a target representing bowling pins; means for providing indicia of a path of a bowling ball from an initial point toward the target, including means for providing a series of viewable points in the form of a series of lights mounted upon a platform in a line between the initial point and the target; means for moving the indicia of the path from a straight line between the initial point and the target while the path is being described, including mechanical means for moving the platform from side to side in a direction generally perpendicular to the path; and means for upending pins which lie in the path, and in which the platform comprises a strip, and the means for moving the platform includes a pair of arms rotatably mounted to the platform at a first set of points and able to rotate at a second set of points spaced apart the same distance as the first set of points.

---

## 4,369,972
## CARD DEALER WHEEL ASSEMBLY WITH ADJUSTABLE ARM

Richard A. Parker, 2221 Coolridge Rd., Holt, Mich. 48842

Filed Feb. 20, 1981, Ser. No. 236,323
Int. Cl.³ A63F 1/10
U.S. Cl. 273—148 A 2 Claims



1. In a card dealer wheel assembly for use on card tables comprising:

an elongate rotatable adjustable extension arm, said extension arm provided with a plurality of spaced-apart adjustment holes therethrough extending longitudinally therealong from one end thereof;

a card holder and dispensing assembly fixedly mounted at one end of said extension arm opposite said adjustment holes, said card holder and dispensing assembly defining first and second card holder compartments therein, said first card holder compartment being open at one end thereof opposite said central support base member, said first card holder compartment provided with a bottom wall being upwardly inclined toward said open end of said first card holder compartment, said second card holder compartment being open at one end thereof toward said central support base member, said second card holder compartment provided with a bottom wall being upwardly inclined toward said open end of said second card holder compartment; and

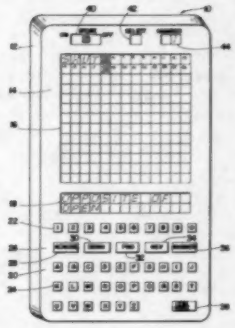
a central support base member, said central support base member adapted for rotatable supporting engagement of said extension arm through selected of said adjustment holes so as to selectively vary the operative radial length of said extension arm.

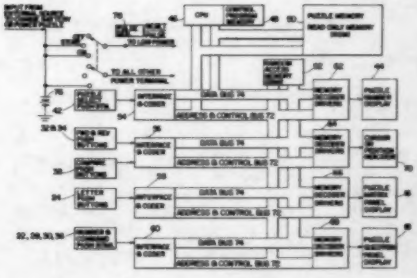
---

## 4,369,973
## ELECTRONIC CROSSWORD PUZZLE

Joseph R. D'Aurora, and David F. Specht, both of 5936 Stumph Rd., Apt. 319, Parma, Ohio 44130

Filed Nov. 21, 1980, Ser. No. 208,941
Int. Cl.³ A63F 9/06
U.S. Cl. 273—153 R 1 Claim





1. An electronic crossword puzzle apparatus comprising:

a central processing unit;

first memory means operatively coupled to said central processing unit for storing a crossword puzzle format;

puzzle display means operatively coupled to said central processing unit for displaying in matrix from said crossword puzzle format, certain individual locations in said format each being assigned a code designation;

addressing means operatively coupled to said central processing unit for addressing a particular word space to be solved in said crossword puzzle format, said addressing means including means to enter a code designation representing an individual matrix location and means to enter down or across commands into said central processing unit to define said word space to be solved;

position indication means operatively coupled to said central processing unit responsive to said addressing means for indicating on said puzzle display means a particular location addressed by said addressing means;

question display means operatively coupled to said central processing unit for automatically displaying a question associated with said addressed word space to be solved;

answer entering means operatively coupled to said central processing unit for entering an answer from a player in response to a question, a player's answer being displayed on said puzzle display means, said puzzle display means being adapted to display a players answer for each addressed word space being solved;

second memory means operatively coupled to said central processing unit for storing the player's answer for each word space location of said crossword puzzle format;

comparing means operatively coupled to said central processing unit for comparing the answers stored in said second memory means with correct answers for said crossword puzzle; and

error indication means operatively coupled to said puzzle display means for indicating the correctness of answers provided by a player;

said answer entering means permitting a player to write over a part of or an entire answer for a word space location which said error indication means indicated an incorrect answer.

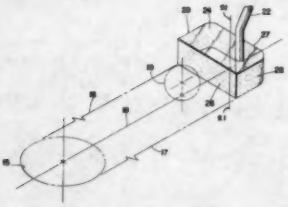
---

**4,369,974**

## GOLF CLUB FOR PUTTING

**Joseph Komperda, 11118 Woodview Blvd., Parma Heights, Ohio 44130**

**Filed Apr. 24, 1981, Ser. No. 257,459**
**Int. Cl.³ A63B *53/04, 69/36***
**U.S. Cl. 273—164** **2 Claims**



1. A golf club putter comprising a putter head and an upwardly extending shaft secured to the putter head, comprising:

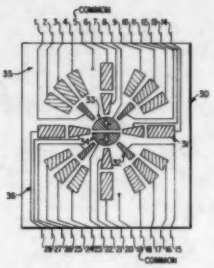
said putter head being a translucent solid parallelogram shaped block having vertically disposed outer surfaces consisting of a front putting surface, a parallel rearward surface, and two intervening side surfaces disposed between said forward and said rearward surfaces, said outer surfaces being opacified surfaces adapted to provide visible alignment means for squaring alignment of said putter head with said cup wherein said opacified surfaces are not visible from a viewing point on a viewing line perpendicular to said putter head and intersecting the centroid of said putter head.

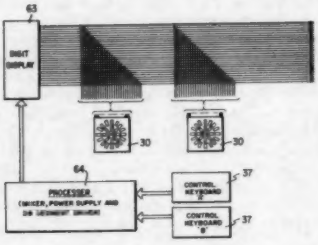
**4,369,975**

## DISPLAY TILE FOR ELECTRONIC CHESS GAME

**Andrew Tarc, 590 Raglan St., P.O. Box 448, Palmerston, Ontario, Canada (N0G 2P0)**

**Filed Apr. 30, 1980, Ser. No. 145,366**
**Claims priority, application Canada, Jan. 28, 1980, 344533**
**Int. Cl.³ A63F *3/02***
**U.S. Cl. 273—237** **3 Claims**





1. An electronic board game comprising:

A. a plurality of display tiles arranged in a chessboard pattern, each of said tiles being a square of translucent material having means for enabling simulated movement of game symbols across said board during game play;

B. a plurality of separate display segment means positioned under said square of translucent material, said display segment means being liquid crystal display elements and being arranged in a generally radial pattern of discontinuous liquid crystal display elements disposed in a concentric circular array of ring configurations, each successive inner ring being comprised of fewer display elements than the preceding ring;

C. said means for enabling a simulated movement including means for selectively enabling individual display of a selected one of many sub-patterns, said selected enabling means including a keyboard having individual keys for selectively including one of at least six different game symbols, the color of said game symbols, the direction of allowed game playing movements and the playing position;

D. said means for simulated movement further including display control means comprising a matrix of wires extending from said liquid crystal display elements to the keys of said keyboard, operation of each of said keys energizing a corresponding combination of wires in said matrix to cause the associated segment to be displayed in said sub-patterns; and

E. microprocessor means having memory means interposed between said keyboard and said matrix of wires for storing in memory the movement and position of the game symbols.

## 4,369,976
## CARD GAME WITH TRUMP SUITS AND TRUMP WORDS

Robert E. Chunn, 1084 Dayton, #301, Aurora, Colo. 80010

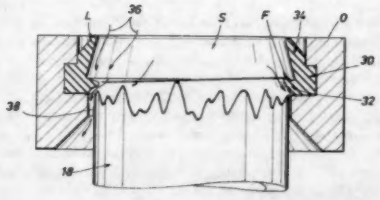
Filed May 15, 1981, Ser. No. 264,141
Int. Cl.³ A63F 1/00
U.S. Cl. 273—303 5 Claims

1. In a card game of the type having a deck of fifty-two playing cards, suit-determining means displayed on each card dividing the deck thereof into four suits of thirteen cards each, said suit-determining means defining a unique category containing at least thirteen species, and card-ranking means common to all four suits for determining the rank of a card within a suit displayed on the face thereof, the improvement which comprises: unique indicia displayed by each card for distinguishing same from all other cards in the deck, said indicia comprising a specie within one of the suit-determining categories, letter designators on each card defining the card-ranking means, and a word or words made up of said letter designators displayed on said card uniquely associated with each specie, one of said words being selectable as a trump word, the order of the letters in the selected trump word cooperating with said letter designators in accordance with a predetermined scoring system to provide a measure of the trick-taking potential of a group of such cards in a hand dealt one of the players.

## 4,369,977
## SEAL FOR AN OVERSHOT AND A METHOD OF DOING SAME

Thomas R. Bishop, and Archie W. Pell, both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed Dec. 1, 1980, Ser. No. 211,522
Int. Cl.³ F16J 15/32
U.S. Cl. 277—1 10 Claims




8. A method of sealing an overshot about a tubular member to prevent fluid migration therebetween during overshot operations, comprising the steps of:

mounting an annular seal ring body within the overshot, with the seal ring body having first and second sealing lips extending radially inwardly onto the bore of the overshot from the seal ring body;

placing the overshot over the tubular member;

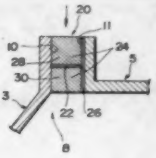
positioning the overshot onto the tubular member to permit the first sealing lip to engage the tubular member to sealably reduce fluid flow therebetween; and,

lowering the overshot onto the tubular member to permit a continuous, annular primary conical sealing surface of the second sealing lip to engage the tubular member for establishing a fluid-tight relation between the second sealing lip and the tubular member for preventing fluid flow therebetween.

## 4,369,978
## GASKET FOR AIR CONDITIONERS

Takeaki Watanabe, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 17, 1980, Ser. No. 187,922
Claims priority, application Japan, Sep. 19, 1979, 54-128491[U]
Int. Cl.³ B32B 3/22, 5/18; F16J 15/10
U.S. Cl. 277—12 12 Claims

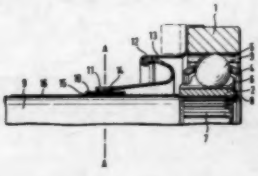



1. In an air conditioner including at least two separate air conditioning units, a gasket interposed between the sealing surfaces of said units, said gasket comprising a first section of a non-porous material oriented transverse to said sealing surfaces and a second section of a porous foam material bonded to said first section in a manner to form a unitary, laminated construction.

## 4,369,979
## SEALING BOOT ARRANGEMENT FOR A UNIVERSAL JOINT

Werner Krude, Siegburg-Kaldauen; Karl-Heinz Müller, Wissen, and Helmut Riemscheid, Lohmar, all of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 384,993
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123573
Int. Cl.³ F16J 15/52
U.S. Cl. 277—212 FB 10 Claims



1. Sealing arrangement for covering and sealing the open space in a constant velocity universal joint, said universal joint comprising a driving part, a driven part circumferentially encircling said driving part, means for transmitting torque between said driving and driven parts, and drive shaft connected and extending axially from said driving part, a sealing boot assembly enclosing the open space of said universal joint and extending in the axial direction of said driving and driven parts, said sealing boot assembly includes an annular cap member attached to and extending axially from said driven part, a

sealing boot having first and second ends, said first end fastened to said cap member, and a sleeve member connected to said second end, said sleeve member arranged coaxially surrounding said drive shaft and axially displaceable relative to said drive shaft, wherein the improvement comprises that said drive shaft has a coating thereon at least in the range of axial displacement of said sleeve member.

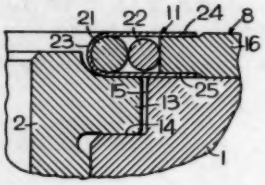
---

**4,369,980**

**FIRE RING FOR CYLINDER HEAD GASKET**

**Robert R. Backlin, Crete, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Oct. 7, 1981, Ser. No. 309,235**
**Int. Cl.³ F16J *15/12***
**U.S. Cl. 277—235 B** **10 Claims**




**1.** An internal combustion engine having a cylinder head gasket comprising, a cylinder block defining at least one bore, a cylinder sleeve received in said bore, a cylinder head, a cylinder head gasket compressively positioned between said cylinder head and said block and sleeve to form a seal, said gasket including a body defining a cylinder opening, a fire ring received in said opening including a radially inner sealing hoop compressively deformed to form a seal between said cylinder head and said cylinder sleeve, a radially outer and reinforcing hoop disposed between said sealing hoop and the body of said gasket pressing radially inward against said inner sealing hoop, a metal wrap enclosing said hoops and fastened to the body of said gasket and compressively sealed with said cylinder head and cylinder block to thereby provide a sealing gasket assembly.

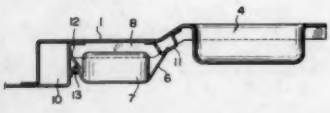
---

**4,369,981**

**FUEL TANK FITTING STRUCTURE**

**Akio Chiba, and Jun Funahashi, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Mar. 6, 1981, Ser. No. 241,208**
**Claims priority, application Japan, Mar. 7, 1980, 55-28114**
**Int. Cl.³ B60K *15/08*; B60R *21/10***
**U.S. Cl. 280—5 A** **8 Claims**




**1.** A structure for fitting a fuel tank in an automotive vehicle, comprising:

a rear floor panel fixed at a rear portion of the automotive vehicle;

a rear seat cross member fixed to the under side of the rear floor panel across the automotive vehicle;

a seat belt anchor fixing cross member fixed to the under side of the rear floor panel across the automotive vehicle; and

supporting means suspended between the rear seat cross member and the seat belt anchor fixing cross member for supporting the fuel tank in position between the rear seat cross member and the seat belt anchor fixing cross member.

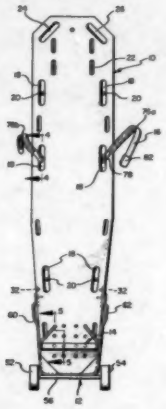
---

**4,369,982**

**SPINE BOARD**

**James R. Hein, 500 Gordon; Wayne T. Herr, Sr., 359 Madison; John J. Niemiec, 1360 Memorial, and Philip Dombrowski, 1273 Price, all of Calumet City, Ill.**

**Filed Dec. 15, 1980, Ser. No. 216,384**
**Int. Cl.³ B62B *1/06***
**U.S. Cl. 280—47.13 R** **2 Claims**



**1.** A spine board comprising, in combination: an elongated generally rectangular-shaped board having a top end and a bottom end, one side of said board comprising a front side and the other side thereof comprising a back side, at least one retaining strap, a plurality of pairs of elongated slots disposed diametrically opposite one another adjacent the side edges of said board along the length thereof for receiving a retaining strap, a pin in each of said elongated slots in said board extending transversely across said slots, said retaining strap being of a two piece construction and comprising a pair of straps having on one end thereof a hook lockingly engageable with the respective ones of said pins in said elongated slots, a buckle on the opposite end of one of said pair of strays for receiving and lockingly adjustably retaining the opposite end of the other one of said pair of straps, and a plurality of pin receiving apertures in said board adjacent the bottom end thereof positioned to receiving therein the respective arms and support pins of a foot support assembly to removably positionally affix said foot support assembly to said board; a foot support assembly comprising a generally rectangular foot support, a pair of arms having one end thereof affixed to said foot support and extending angularly laterally upwardly therefrom, the opposite ends of said pair of arms being formed to extend through said pin receiving apertures in said board and to lockingly engage with the back side of said board, said pair of arms affixed to said foot support, further comprising a horizontally extending portion of a length to extend from the front side of said board to the back side thereof, said horizontally extending portion terminating with a vertically extending portion which engages with the back side of said board; and a pair of support pins having one end thereof affixed to said foot support and positioned to permit the opposite ends of said pins to seat within said pin receiving apertures when said foot support is abutted against the front side of said board and said arms are lockingly engaged within said pin receiving apertures; a pin receiving aperture in each of the opposite side edges of said board in diametrically opposed relationship; and a wheel assembly removably affixed to said board, said wheel assembly comprising a generally

U-shaped member having a horizontally extending portion and a pair of spaced apart arms for receiving therebetween the bottom end of said board, a pin affixed to the ends of each of said arms proportioned and positioned to be received within the respective ones of said pin receiving apertures in the opposite side edges of said board to removably affix said wheel assembly to said board, and a pair of wheels rotatably supported in spaced apart relationship by said U-shaped member to permit said board to be transported by rolling it on said wheels.

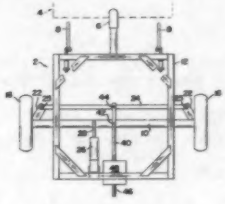
---

**4,369,983**

## TRAILER WITH MASS RESTRAINT

**Leonard T. Charek, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio**

**Filed Oct. 27, 1980, Ser. No. 200,877**
**Int. Cl.³ B62D *9/00***
**U.S. Cl. 280—81 A** **9 Claims**



1. In a trailer, the improvement comprising
a transverse axle,
wheels mounted on members pivoted at each end of said axle about an inclined axis;
a connecting rod connecting said members to turn said wheels in unison, and
a mass, the lateral acceleration of which applies a first steering moment about said inclined axis to balance a second opposed moment applied about said axis by the ground reactive force on said wheels.

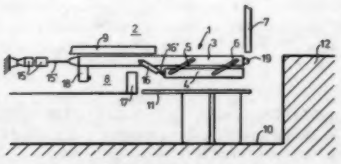
---

**4,369,984**

## PASSENGER VEHICLE SUCH AS A BUS HAVING A LATERALLY EXTENDING STAIR ASSEMBLY

**Hans Hagen, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Nov. 10, 1980, Ser. No. 205,421**
**Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946531**
**Int. Cl.³ B60R *3/02*; B62D *25/22***
**U.S. Cl. 280—166** **17 Claims**



1. A stair assembly for a vehicle having a lateral access opening, said stair assembly comprising a horizontal first stair member, a horizontal second stair member disposed at a level below the first stair member, means suspending said second stair member from said first stair member for movement relative thereto downwardly and laterally outwards to an extended position and upwardly and laterally inwards to a retracted position, said second member being beneath said first member in said retracted position, and means for moving said first stair member horizontally linearly between a retracted position in the access opening and an extended position projecting from the access opening and for moving said second stair member between said extended and retracted positions thereof such that in the extended positions of both stair members a step is formed between said stair members outside said access opening and in the extended position of said first stair member with the second stair member retracted, the first stair member can bridge a gap between the access opening and an adjoining platform spaced therefrom.

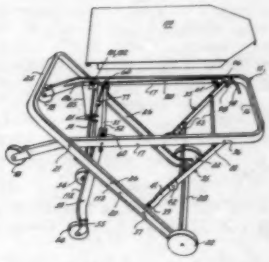
---

**4,369,985**

## ONE MAN CART FOR ARTICLES

**Elroy E. Bourgraf, Cincinnati; Robert E. Dunn, Washington Court House, and Ronald D. Vance, Wilmington, all of Ohio, assignors to Burt Weil, Cincinnati, Ohio**

**Filed Dec. 24, 1980, Ser. No. 220,161**
**Int. Cl.³ B62B *1/00***
**U.S. Cl. 280—641** **8 Claims**



1. A cart foldable between an erect and a folded position comprising:
a horizontal main frame,
auxiliary wheels mounted at the forward end of said main frame,
a pair of downwardly and rearwardly inclined rear legs pivoted at their upper ends to said main frame,
a pair of forward legs pivoted at their upper ends to the front portion of said main frame and depending generally vertically from said main frame,
a releasable brace between said main frame and said rear legs to maintain them in an erect position,
means releasably locking said front legs in an erect position,
means at the forward end of the cart for releasing said front legs to permit them to swing rearwardly, and
means at the rear end of the cart to release said braces for the rear legs and said front legs to permit said cart to be changed to a folded position.

---

**4,369,986**

## FOLDING STROLLER FOR TRANSPORTING CHILDREN

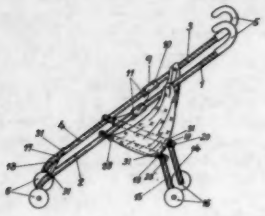
**Alicia B. de la Fé, Pi y Margall 63, Las Palmas de Gran Canaria, Spain**

**Filed Jun. 13, 1980, Ser. No. 159,074**
**Claims priority, application Spain, Jun. 20, 1979, 244.041**
**Int. Cl.³ B62B *11/00***
**U.S. Cl. 280—644** **3 Claims**

1. A folding stroller for transporting children, comprising:
two side rods providing support for a seat, each of said side rods having a lower portion provided with a wheel and a separate upper portion provided with a steering handle;
metal plates connecting said lower and upper portions of each of said side rods, two said plates being pivotally

connected tangentially to each of said portions proximate the ends of said portions opposite said wheel and said steering handle, such that the articulated ends of said portions remain separated;

a movable sleeve positioned over each pair of said plates on said side rods so as to maintain said upper and lower portions in rigid axial alignment, said sleeves being retractable from said plates by sliding onto said upper portions;



a stop connected to each of said lower portions proximate said metal plates so as to maintain said sleeves in position about said plates; and

a first cross rod rotatably connecting said lower portions of said side rods, said first cross rod being divided into two pivotally articulated sections, whereby the stroller can be folded and unfolded by articulation of said first cross rod and said side rods and movement of said sleeves.

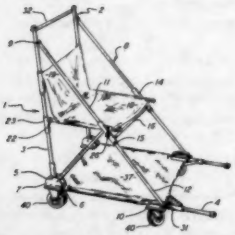
---

**4,369,987**

**FOLDING WHEELED CHAIR/LUGGAGE CARRIER**

**Nancy B. Witherell, R.F.D. #1, Box 54A, Center Harbor, N.H. 03226**

**Filed Mar. 16, 1981, Ser. No. 244,285**
**Int. Cl.³ B62B *7/08***
**U.S. Cl. 280—644** **4 Claims**



1. A folding wheeled chair/luggage carrier having a frame structure comprising a pair of generally triangular side frames, each carrying two support wheels and each comprising pivotally connected, elongated base and back support members, an elongated strut which is pivotally connected at its ends adjacent to the free ends of said support members, each said strut being in the form of a pair of pivotally connected upper and lower strut members which can be maintained in an extended, aligned condition and releasable locking means for maintaining a desired angular relationship between said base and back support members, and lateral bracing means connecting said side frames whereby the latter are movable between an extended, use position in which they maintain the side frames in spaced parallel relationship with the four wheels at substantially the four lower corners of the frame structure, and a retracted, stowage position, wherein the improvement comprises

(a) a pair of elongated strut bracing members each pivotally connected to the releasable locking means and to adjacent the pivotal connection of the base and back support members,

(b) a pair of elongated seat frame members each pivotally connected to the frame structure, for pivotal movement between a stowage position and a use position,

(c) seat and back support panels of foldable material extending between and fixed respectively to said seat frame members and said back support members,

(d) releasable catch means for selectively retaining said seat frame members in their use position, and

(e) said releasable locking means comprising a pair of sleeves slidably mounted one on each said upper strut member and stop means rigidly mounted on each said lower strut member beneath the pivotal connection whereby, in the use position of said seat members, said sleeves are held down by the occupant against their respective stop means so as to closely embrace the pivot connections between their respective strut members and positively retain said strut members in their extended, aligned condition, said bracing members being pivotally mounted to respective ones of said sleeves.

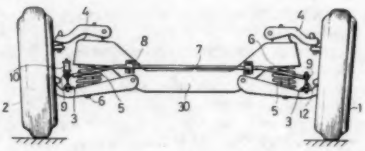
---

**4,369,988**

**STABILIZER FITTING APPARATUS**

**Tatsuya Takagi, 6-10, Araebisu-machi, Nishinomiya, Hyogo-ken, Japan**

**Filed Oct. 22, 1980, Ser. No. 199,527**
**Claims priority, application Japan, Nov. 22, 1979, 54-150644**
**Int. Cl.³ B60G *19/00***
**U.S. Cl. 280—689** **5 Claims**



1. A stabilizer assembly comprising:

(a) a torsion bar having a straight central portion and bent end portions, said central portion being adapted to be twistably mounted on the frame of a vehicle;

(b) a reciprocal device disposed at least at one end of said torsion bar;

(c) said reciprocal device comprising first and second members which are movable relative to each other, said first member being secured to the end of said torsion bar and said second member being adapted to be secured to a swing arm of a suspension system of a vehicle; and

(d) said reciprocal device being normally positioned in a neutral position and movable under a resisting force and a limited stroke, said resisting force gradually increasing according to the displacement from said neutral position but said resisting force being substantially zero as said recirpocal device is returned to said neutral position.

---

**4,369,989**

**STABILIZING JACK FOR SKID STEER VEHICLE**

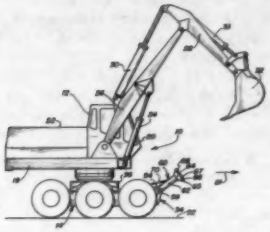
**Harry S. Mankey, Dallas, Tex., assignor to Standard Manufacturing Company, Incorporated, Dallas, Tex.**

**Filed Aug. 1, 1980, Ser. No. 174,642**
**Int. Cl.³ B60S *9/02***
**U.S. Cl. 280—763** **7 Claims**

7. An improved vehicle of the type having at least three sets of wheel members to support the vehicle on a surface, the middle set of wheel members extending below a plane lying tangent to the bottom of the endmost sets of wheel members, the improvement which comprises:

a jack pivotally mounted on said vehicle adjacent a first set

of endmost wheel members and responsive to movement of the vehicle in a predetermined direction under the action of at least some of the wheel members for pivotal movement overcenter to a support position so that the vehicle is supported on the surface by said jack, the middle set of wheel members and the endmost set of wheel members opposite said first set of endmost wheel members



and is thereby prevented from rocking endwise about said middle set of wheel members;

said jack being responsive to movement of the vehicle in the opposite direction under the action of at least some of the wheel members for pivotal movement overcenter out of the support position so that the vehicle is once again supported solely by the wheel members.

---

**4,369,990**

## COUPLING ASSEMBLY FOR CONNECTING A SLIDER TO A DRIVE WIRE IN A PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

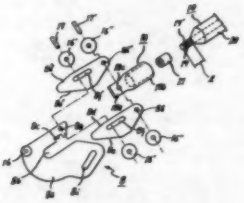
**Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan**

**Filed Mar. 30, 1981, Ser. No. 249,998**

**Claims priority, application Japan, Apr. 1, 1980, 55-042410[U]**

**Int. Cl.³ B60R *21/10***

**U.S. Cl. 280—804** **1 Claim**



1. In a passive vehicle occupant restraint belt system that includes a guide rail affixed to the vehicle body, a slider receiving a portion of a restraint belt and movable along the guide rail to transfer the belt portion between restraint and release locations, and a drive wire driven by drive means and coupled to the slider, the portion of the drive wire that moves along the rail having a core and a covering of a polymeric material, a coupling assembly comprising an uncovered segment of the core adjacent the end of the drive wire, a pressed-on coupling ring affixed to the uncovered segment of the drive wire and a coupling sleeve connected to the slider received over the coupling ring and over a portion of the drive wire covering adjacent the uncovered segment, the sleeve being pressed onto the coupling ring and said covering portion, whereby concentrated bending stresses in the core adjacent the coupling ring are eliminated due to support of the core adjacent the coupling ring by said covering portion within the sleeve.

**4,369,991**

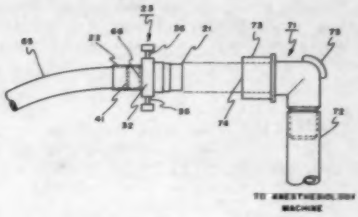
## CONNECTOR FOR ENDOTRACHEAL TUBES AND CATHETERS

**Gerald S. Linder, 16693 Charmel La., Pacific Palisades, Calif. 90272**

**Filed Oct. 4, 1979, Ser. No. 81,694**

**Int. Cl.³ F16L *35/00***

**U.S. Cl. 285—38** **15 Claims**



1. An improved connector for inter-coupling between the output breathing circuit connection of an anesthesiology machine and the smooth outer wall surface of the open proximal end of a cylindrical, resilient endotracheal tube, comprising in combination:

(a) a hollow cylindrical body of relatively rigid, nonperforated material having an open input end adapted for coupling to the breathing circuit connection of an anesthesiology machine, said hollow cylindrical body further having an open output end adapted for sliding over the smooth outer wall surface of the proximal end portion of a cylindrical endotracheal tube, the inner diameter of the open output end of said hollow cylindrical body being slightly larger than the outer diameter of the cylindrical, resilient endotracheal tube for which the connector is designed to be used; and

(b) a single annular internal ridge formed integrally within said hollow cylindrical body near the output end, said annular ridge projecting radially inward from the inner wall surface of said hollow cylindrical body, the tip of said annular internal ridge being adapted for physically engaging the smooth outer wall surface of and forming a depression into and continuously around the smooth outer wall surface of the proximal end portion of the endotracheal tube upon the insertion of the proximal end portion into the open output end of said hollow cylindrical body, said annular internal ridge thereby providing an air-tight seal between the smooth outer wall surface of the endotracheal tube and the inner wall surface of said hollow cylindrical body by the engagement of the tip of said annular ridge with the smooth outer wall surface of said resilient endotracheal tube, said annular ridge further maintaining physical separation between the inner cylindrical wall surface of the open end of said hollow body and the smooth outer cylindrical wall surface of the endotracheal tube adjacent each side of said annular ridge to minimize contact between the cylindrical wall surfaces, said connector being rotatable with respect to the endotracheal tube about the axis of said hollow, cylindrical body in a swivel-like manner while maintaining said air-tight seal.

---

**4,369,992**

## CONVOLUTED HOSE FITTING

**Paul J. E. Fournier, and Guenter O. Kunz, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.**

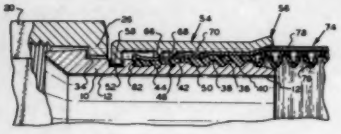
**Filed Nov. 24, 1980, Ser. No. 209,997**

**Int. Cl.³ F16L *33/20***

**U.S. Cl. 285—256** **3 Claims**

1. A hose fitting for hose having a convoluted inner tube of synthetic plastic material comprising, in combination, a tubular nipple having a bore, an outer connection end, a hose receiving

outer surface and an inner hose receiving end, connection means defined on said nipple connection end, a helical projection defined upon said nipple outer surface adjacent said inner end having a pitch substantially corresponding to the pitch of the convolutions of the hose inner tube to be received upon said outer surface, an annular socket circumscribing said nipple outer surface having an inner surface, a plurality of axially spaced locking annular serrations defined on said socket inner surface for engaging and compressing a hose mounted upon said nipple outer surface, said serrations each including a conical surface defined thereon on the side of the serrations disposed toward said nipple inner end and converging in a direction away from said nipple inner end whereby said conical



surfaces aid in the insertion of hose upon said nipple and within said socket, said nipple outer surface in radial alignment with said locking serrations increasing in diameter in the axial direction from said outer end toward said inner end defining a reverse angle ramp to resist separation of a hose mounted on said nipple outer surface under tension forces, annular grooves defined in said nipple outer surface in radial alignment with at least two of said annular serrations, said grooves each including a radial side defining the groove side nearest said nipple inner end, and an annular secondary serration defined on said socket inner surface intermediate said reverse angle ramp and said helical projection to compress hose located on said nipple outer surface intermediate said locking serrations.

---

**4,369,993**

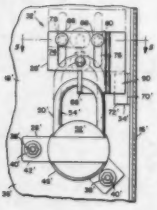
## DOOR LOCKING DEVICE FOR USE WITH INTERCHANGEABLE PADLOCKS

**Luis A. Rodriguez, 2629 11th St., St. Petersburg, Fla. 33704**

**Filed Oct. 17, 1980, Ser. No. 198,168**

**Int. Cl.³ E05B** *63/02, 65/06;* **E05C** *1/04, 13/02*

**U.S. Cl. 292—148** **15 Claims**



1. A locking device for a door and jamb, for use with a padlock having a body, a shackle slidable in the body between locked and unlocked positions, and an actuator on one face of the body for unlocking the shackle, the device comprising:

means for removably attaching the padlock to the interior surface of the door with a portion of the actuator face of the padlockexposed through an aperture in the door;

a handle slidably carried by the door and accessible from the exterior thereof;

means for connecting said handle to the shackle of the padlock whereby the motion of said handle can move the shackle between its locked position and its unlocked position; and

a strike plate connected to the jamb and cooperating with the shackle of the padlock to prevent the opening of the door when the shackle is locked to the body of the padlock.

15. A locking device for use with a combination padlock for locking a door of a locker comprising;

a bracket removably attached to the interior surface of the door of the locker, said bracket having a lower curved portion to cradle the circumferential surface of the body of the padlock and a rear plate to hold the body of the padlock to the interior surface of the door with the dial portion of the padlock exposed through an aperture in the door, the aperture being less than the total diameter of the body of the padlock;

a latch for sliding vertical motion with respect to the interior surface of the door, said latch plate including a tab extending inward therefrom and having an aperture for receiving the shackle of the padlock;

means for supporting said latch plate on the interior surface of the door for vertical movement;

a handle extending outward from said latch plate through a vertical slot in the door; and

a strike plate attached to an interior side surface of the locker and having a locking section extending laterally inward behind the interior surface of the door, said locking section cooperating with the shackle and said latch plate to lock the door of the locker.

---

**4,369,994**

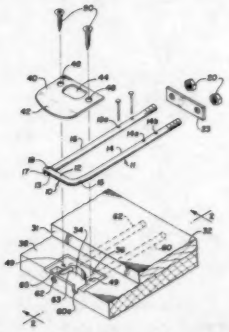
## STRIKE PLATE SUPPORT

**Steve P. Vorves, 6250 Lyons Rd., Garland, Tex. 75043**

**Filed Aug. 11, 1980, Ser. No. 176,669**

**Int. Cl.³ E05C** *21/02*

**U.S. Cl. 292—340** **5 Claims**

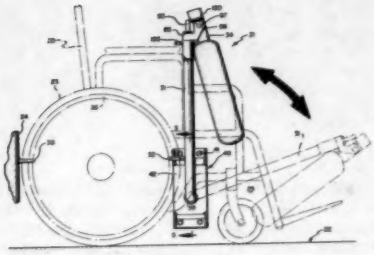


1. Apparatus for securing a strike plate having a deflected tang portion extending outwardly from the plane of the body portion of the plate to a door jamb comprising: a generally L-shaped connector member having a pair of generally perpendicularly extending legs, a first of said legs being arranged to engage the tang on the strike plate when positioned parallel to the plane of the body of the strike plate, a portion of the second leg being deflected to extend away from the plane of the body of the strike plate to position the second leg in a plane spaced from the plane of the first leg; a rod; means securing said rod to the outer extremity of the first leg such that the rod and the second leg on said connector member lie in a common plane; and anchor means on said rod and on said second leg for attachment to a door jamb.

## 4,369,995
## WHEELCHAIR AND OCCUPANT RESTRAINING APPARATUS

Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach & Car Equipment Corporation, Elk Grove Village, Ill.

Filed Aug. 28, 1980, Ser. No. 182,218
Int. Cl.³ B60N 1/02; B60P 3/06, 7/08
U.S. Cl. 296—65 A 21 Claims



1. In a vehicle having a wall and a member at a location spaced from said wall, an apparatus for restraining a wheelchair and its occupant, said apparatus comprising:

a first U-shaped element;

means for mounting said first U-shaped element on said member;

said first U-shaped element comprising means for receiving the periphery of a wheelchair wheel;

an elongated post located alongside said vehicle wall;

means mounting said post on said wall for pivotal movement between a depressed position, in which said post extends alongside a bottom of said wall, and an upright position;

a second U-shaped element attached to said post and located in opposed facing relation to said first U-shaped element when said post is in its upright position;

said second U-shaped element comprising means for receiving the periphery of a wheelchair wheel at a location thereon substantially diametrically opposite to the location thereon received in said first U-shaped element;

said first and second U-shaped elements comprising means cooperating to hold said wheelchair wheel in compression.

3. An apparatus for restraining a wheelchair and its occupant in a vehicle having a wall, said apparatus comprising:

an elongated post located alongside said vehicle wall;

means mounting said post on said wall for pivotal movement about an axis, between a depressed position, in which said post extends alongside a bottom of said wall, and an upright position;

a restraining arm;

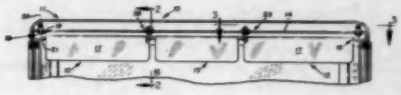
means mounting said restraining arm on said post for pivotal movement about a first axis between a retracted position in which said arm extends alongside said post and an extended position in which said arm extends outwardly from said post along said vehicle wall;

and means mounting said restraining arm for pivotal movement about a second axis transverse to said first axis, and between said extended position and a restraining position in which said arm extends transversely from said wall across the chest of an occupant in said wheelchair.

## 4,369,996
## SUN VISOR SYSTEM FOR TRUCKS

David W. Fluck, San Jose, Calif., assignor to PACCAR Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 241,658, Mar. 9, 1981, abandoned. This application Nov. 19, 1981, Ser. No. 322,890
Int. Cl.³ B60J 3/02
U.S. Cl. 296—97 K 6 Claims



1. A sun visor system for the windshield of a vehicle, comprising:

left and right pivotal, swingable visor assemblies, each having an outer end with a swivel base secured to the vehicle body near the side of the windshield and providing swinging movement about a generally vertical axis, between a normal forward position and a side window position, each swivel base supporting a rod extending into the edge of a visor for permitting pivotal movement of the visor on the rod, and each of the visor assemblies having a generally horizontal projection at its inner, free end; and

a center visor assembly having a forwardly and rearwardly pivotal visor and a pair of special mounting brackets, one at each end, secured to the vehicle body between the left and right visors so as to provide a generally continuous curtain of visors across the top of the windshield, each special mounting bracket including clip means for receiving and cradling the projection at the inner end of the adjacent side visor when that side visor is in a normal forward position.

## 4,369,997
## CHAIR

Simon Desanta, Gütersloh, Fed. Rep. of Germany, assignor to Kusch & Co., Sitzmobelwerke KG, Hallenberg, Fed. Rep. of Germany

PCT No. PCT/DE80/00010, § 371 Date Sep. 29, 1980, § 102(e) Date Sep. 29, 1980, PCT Pub. No. WO80/01534, PCT Pub. Date Aug. 7, 1980
PCT Filed Jan. 29, 1980, Ser. No. 209,404
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903251; Feb. 3, 1979, 2904148
Int. Cl.³ A47C 1/034
U.S. Cl. 297—68 15 Claims

1. An adjustable chair with an elevated seat having a backrest, seat and footrest which are adjustable from a first position in which the seat is generally horizontal, the backrest is to the rear of at least a major portion of the seat and the footrest extends forward of the front edge of the seat to a second position in which the backrest is forward of said first position, the

seat is tilted forward and the footrest is to the rear of the forward edge of the seat, said chair comprising:

(a) an upstanding support pedestal having a generally horizontal pivot shaft at its upper end;

(b) a generally S-shaped yoke having its central portion pivotally secured to said pivot shaft with an upper portion pivotally supporting said backrest for movement about a substantially horizontal pivot point and a lower portion extending downwardly and forwardly to form said footrest;

(c) said seat being secured to at least one of said central portion of said yoke and said pedestal so that upon movement of the yoke to pivot the footrest backward and the backrest forward, said seat will tilt forward so as to partially support a person in the standing position in front of the chair.

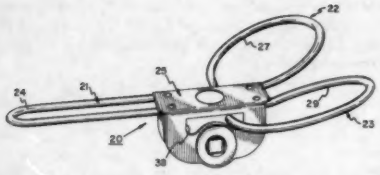
---

**4,369,998**

## TWIN TORSIONAL BICYCLE SEAT UNDERCARRIAGE

**Robert Blase, 1009 Round Hill Rd., Fairfield, Conn. 06430**

**Filed Sep. 2, 1980, Ser. No. 183,302**
**Int. Cl.³ B62J 1/00**
**U.S. Cl. 297—195** **17 Claims**




1. A bicycle seat-supporting undercarriage comprising

A. a bracket member adapted for cooperative interengagement with bolt means for mounting to a bicycle seat post, and

B. a wire member formed into two independent loop systems extending rearwardly and laterally from said bracket member, each of said loop systems comprising

(a) a secured portion mounted to the bracket member, and

(b) a laterally extending loop portion

(1) extending from the secured portion in a substantially continuous curve, and

(2) having its terminating end retainingly engaged with said bracket member;

C. said bracket member having

(a) a central body portion and

(b) two depending side portions extending therefrom, each incorporating

(1) loop receiving means for retainingly supporting the terminating ends of the loop portions while allowing loop deflection and free movement of the terminating ends, and

(2) securement arms for peripherally embracing and supportingly retaining the secured portion of each loop system,

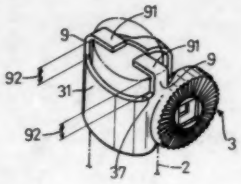
whereby each of said independent loop systems is resiliently, torsionally flexible, thereby achieving a bicycle seat undercarriage which provides comfortable support and repeated resilient deflection in response to a rider's side-to-side movements.

**4,369,999**

## SADDLE FOR BICYCLE

**Tetsuo Kashima, Osaka, Japan, assignor to Kashima Saddle Mfg. Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 926,028, Jul. 19, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 184,901**
**Claims priority, application Japan, Apr. 18, 1978, 53-51502**
**Int. Cl.³ B62J 1/00**
**U.S. Cl. 297—195** **7 Claims**




1. A saddle support for securing a saddle to the top of a seat pillar having first and second opposed clip washers for engagement with a loop clip, the loop clip comprising a clip band fittable around a seat pillar of a uniform diameter and having an upper end profile, a stopper formed on and extending from an upper portion of the clip band, first and second holding portions extending from opposite ends of the clip band and opposed to each other, each of the holding portions having a curved portion in the form of a circular arc and fittable around the seat pillar on its inner side and a bearing surface on its outer side for engagement with one of the clip washers to hold the saddle in a selected position, the stopper comprising a plurality of tabs each directed inwardly of the clip band and extending toward each other and spaced above the clip band over the upper end profile of the seat pillar, each tab projecting substantially to the center of the seat pillar, the stopper positionable over the upper end of the seat pillar to cover a substantial portion thereof such that downward slippage of the loop clip relative the seat pillar is thereby prevented.

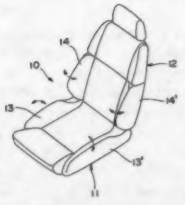
---

**4,370,000**

## SEAT FOR MOTOR VEHICLES

**Kenichi Kazaoka, Nagoya, and Takemi Hattori, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan**

**Filed Aug. 14, 1980, Ser. No. 178,027**
**Claims priority, application Japan, Aug. 22, 1979, 54-106832**
**Int. Cl.³ A47C 3/00**
**U.S. Cl. 297—284** **11 Claims**




1. A seat with lateral edges capable of selective adjustment without the use of any exterior levers or knobs comprising:

means for pivotably mounting the first lateral edge on the frame of the seat,

means for pivotably mounting the second lateral edge on the frame of the seat opposite said first lateral edge,

an operational lever pivotably connected to said frame for

engaging said first lateral edge and limiting the outward movement of said first lateral edge,

linkage means, interconnecting said second lateral edge and said operational lever, for causing said operational lever to pivot inwardly and outwardly in concert with said second lateral edge,

releasable lock means for locking the linkage means in selected fixed positions to thereby fix the second lateral edge and operational lever and thus limit the outward pivoting of said first lateral edge, and

means for releasing said releasable lock means when the first lateral edge is pivoted inwardly away from said operational lever,

whereby the inward rotation of said first lateral edge will enable the user of the seat to adjust the position of the lateral edges as desired.

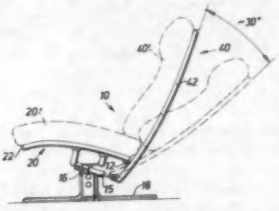
---

**4,370,001**

## BASIC FRAME FOR AN ADJUSTABLE DAMPER-ACTUATED CHAIR

**Stellan Örnberg, Klintvägen 3, 552 59 Jönköping, Sweden**

**Filed Sep. 22, 1980, Ser. No. 189,408**
**Claims priority, application Sweden, Jul. 1, 1980, 8004875**
**Int. Cl.³ A47C 1/02**
**U.S. Cl. 297—355** **6 Claims**




1. A chair structure having an adjustable back which can be locked in different positions, comprising:

a framework comprising frames of substantially rigid tubing, namely a seat frame and a back support frame;

a frame holder fixed to and underlying the seat frame for supporting the framework as a whole on a base structure, such that the framework is swivelable on the base structure about a vertical axis in the middle plane of the framework; and

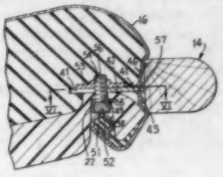
the improvement comprised in that said seat frame and back frame are each a simple, closed, essentially rectangular loop of said tubing, said loops being of essentially the same width, the seat loop being shorter and almost square, the back loop being substantially longer, hinge means uniting the seat loop along its back segment with the back loop, said hinge means extending transversely across the back loop at a distance (x) from the bottom segment thereof, so that the bottom portion of the back loop which is between its said bottom segment and said hinge means forms a lever for limiting motion of said back loop in relation to the seat loop, the frame holder fixed to the seat loop comprising a downwardly convex transverse arch structure fixed at its opposite ends to the two side segments of the seat loop, said bottom portion of the back loop extending in underneath the seat loop such that the bottom segment of the back loop is spaced forward of as well as below the rear segment of said seat loop and opposes said downwardly convex arch structure, and a gas damper lockable in optional positions, said gas damper being spaced entirely below the rear portion of the seat loop and extending approximately parallel to the plane thereof in connected relation from said bottom segment of the back loop to the downward arched portion of the frame holder.

**4,370,002**

## ATTACHMENT FOR CHAIR ARM

**Earl H. Koepke, Burr Oak Township, St. Joseph County, Mich., assignor to Kimball International, Inc., Jasper, Ind.**

**Filed Jun. 12, 1980, Ser. No. 158,746**
**Int. Cl.³ A47C 27/00**
**U.S. Cl. 297—452** **5 Claims**




1. A connection for securing an appendage to an article of furniture, said connection comprising:

body supporting frame means including a continuous channel extending about and having a width dimension crosswise of the longitudinal extent of said channel and adjacent the outer part of said channel that is at least equal to or greater than the width of said channel adjacent the bottom thereof;

upholstery covering at least a portion of said body supporting frame means, an edge portion of said upholstery being received in said channel and securing means received in said channel for effecting a securement of said upholstery in said channel to said body supporting frame means;

bracket means defining a bottom wall in said channel, said bottom wall having further means defining a hole therethrough in which is received an elongated first fastener member having a head thereon and at one end thereof, said head lying in said channel, the other end of said first fastener member having releasable coupling means thereon releasably coupled to a second fastener member;

bracket means defining an opening in said upholstery; and

a bracket member secured to said appendage and having an extension member thereon extending through said opening in said upholstery and between said first and second fastener members, said first and second fastener members effecting a clamping of said extension member between said second fastener member and said body supporting frame means, said securing means effecting a covering of said head of said first fastener member so that it is not exposed when said article of furniture is fully covered.

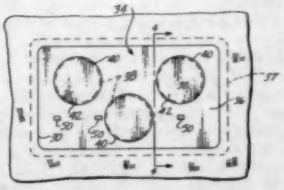
---

**4,370,003**

## TEMPORARY GAS SEAL FOR GAS LEVEL DRIFT OF AN IN SITU OIL SHALE RETORT

**Rudolph Kvapil, Golden, and Thomas E. Ricketts, Grand Junction, both of Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.**

**Filed Oct. 31, 1980, Ser. No. 202,467**
**Int. Cl.³ E21C 41/10**
**U.S. Cl. 299—2** **26 Claims**




1. An off gas seal for a gas collection drift communicating with and extending away from an in situ oil shale retort con-

taining a fragmented permeable mass of formation particles containing oil shale in a subterranean formation containing oil shale, the off gas seal comprising:

a rigid gas isolation barrier sealed at its periphery to the walls of the gas collection drift;

at least one gas flow passage extending through the rigid gas isolation barrier;

a flexible membrane for closing such gas flow passage for inhibiting passage of off gas through the gas flow passage and past the gas isolation barrier from a side of the gas isolation barrier adjacent the fragmented mass to a side of the barrier opposite the fragmented mass;

fastening means sealing the flexible membrane to the gas isolation barrier for supporting the membrane on the barrier for closing such gas flow passage; and

means for unsealing such flexible membrane from the gas isolation barrier for removing the support of the flexible membrane on the barrier for opening such gas flow passage for permitting passage of off gas through the open gas flow passage to a portion of the gas collection drift on the side of the gas isolation barrier opposite the fragmented mass.

---

**4,370,004**

## MAGNETICALLY SUSPENDED TYPE MOMENTUM RING ASSEMBLY

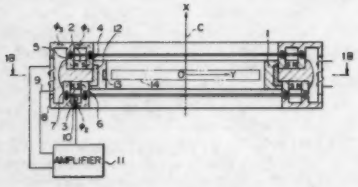
**Hiroshi Morikawa, Tokyo; Toshiharu Kumazawa, Fujisawa, and Hiroshi Takagi, Kamakura, all of Japan, assignors to Mitsubishi Precision Co., Ltd., Kanagawa and Mitsubishi Electric Corporation, Tokyo, both of, Japan**

**Filed Oct. 6, 1980, Ser. No. 194,617**

**Claims priority, application Japan, Apr. 28, 1979, 54/52044**

**Int. Cl.³ F16C *39/00***

**U.S. Cl. 308—10** **8 Claims**




1. A magnetically suspended type momentum ring assembly comprising:

a rotatable momentum ring having a rotating axis in the center of said ring, and an annular solid portion thereof whereto an effective mass of said momentum ring is concentrated;

a fixed member provided for enclosing therein said rotatable momentum ring;

a non-contact magnetic bearing means for generating a force for suspendingly supporting said rotatable momentum ring in a radial and an axial direction within said fixed member, said magnetic bearing means being arranged in a peripheral portion of said momentum ring assembly;

said non-contact magnetic bearing means comprising a first magnetic suspension means including permanent magnet means generating first and second magnetic attractions which are axially opposite to one another and act between said momentum ring and said fixed member, and a second magnetic suspension means including electro-magnet means generating a third axial magnetic attraction varying in response to a change in electric current applied to said electro-magnet means, said first and second magnetic attractions contributing to suspension of said momentum ring in said radial direction, and a combination of said first through third magnetic attractions contributing to the suspension of said momentum ring in said axial direction;

means for controlling the electric current applied to said electro-magnet means in response to changes in direction and magnitude of an external force acting on the momentum ring in the axial direction; and

a drive means for rotating said momentum ring about said rotating axis, said drive means being provided in said peripheral portion of said momentum ring assembly.

---

**4,370,005**

## DEVICE FOR PREVENTING TUBULAR BUSHING ASSEMBLY FROM SLIPPING OUT

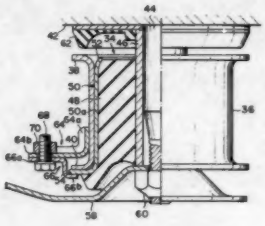
**Hiroshi Sarai; Eiichi Hamada, and Norihiro Ueda, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan**

**Filed Oct. 23, 1980, Ser. No. 200,023**

**Claims priority, application Japan, Jul. 23, 1980, 55-103152[U]**

**Int. Cl.³ F16C *11/04***

**U.S. Cl. 384—154** **9 Claims**




1. In a device for preventing a tubular bushing assembly being used as a vibration isolator from slipping out of a hole provided in a bushing attaching portion, wherein a pair of said tubular bushing assemblies are fitted into a pair of pivot coupling between a vehicle body and a suspension member in a suspension system for a vehicle and each tubular bushing assembly includes an inner sleeve for receiving therein a pivot extending from said vehicle body, a tubular resilient member receiving therein said inner sleeve and attached thereto, and an outer sleeve receiving therein said resilient member and attached thereto, said tubular bushing assembly being fitted into the hole provided in the bushing attaching portion, the improvements comprising:

a flange portion provided at one end of said outer sleeve and extending radially outward of said hole provided in said bushing attaching portion along the opening edge of said hole,

a support portion provided in said bushing attaching portion, said support portion extending radially outward of said bushing attaching portion over one end thereof;

a holder member joined to said support portion at one end thereof and the other end thereof extending inwardly of said outer sleeve along the bottom surface of said flange portion so as to hold said flange portion between the circumferential edge of said hole and the other end of the holder member; and

a means for connecting said holder member to said support portion removably.

---

**4,370,006**

## BANKING MEDIA SECURITY MECHANISM FOR AUTOMATIC BANKING MACHINES

**Harry T. Graef, Dover; Scott A. Mercer, Hanoverton; Jeffrey A. Hill, North Canton, all of Ohio, and Spiro Leontas, Hesperia, Calif., assignors to Diebold Incorporated, Canton, Ohio**

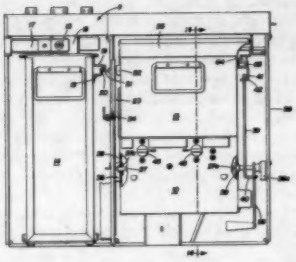
**Filed Oct. 3, 1980, Ser. No. 193,847**

**Int. Cl.³ E05B *65/04***

**U.S. Cl. 312—215** **9 Claims**

1. An ATM having multiple, diverse-function, sealed, tam-

per-indicating containers removably located therein including a depository container, a divert container and at least one note container; each container having a door mounted thereon movable between positions opening or closing an access opening formed in such container; a lock on each container locking the container door closed when in locked mode outside of and as loaded into the ATM; a lock actuator mounted on the ATM for each container lock operative to engage and actuate to unlocked mode the lock of its respective container when the latter is loaded into the ATM and to hold such container



loaded in the ATM; each such lock actuator acting as a control preventing either such lock actuator or an adjacent container from being loaded into the ATM when its lock is not in unlocked mode; and interlock means operatively connecting said containers one to another and to the ATM when said containers are loaded in the ATM in ATM operative status; whereby such lock actuators acting as controls to be actuated in a sequence of steps without omitting any step during assembly or disassembly, thereby rendering the ATM impervious to misloading and maintaining container integrity at all times.

---

**4,370,007**

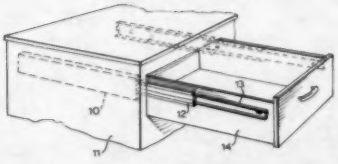
## SLIDING DRAWER SUSPENSION

**Jack P. Fler, Kitchener, Canada, assignor to Jacmorr Manufacturing Limited, Kitchener, Canada**

**Division of Ser. No. 10,419, Feb. 8, 1979, Pat. No. 4,272,139, which is a continuation-in-part of Ser. No. 941,585, Sep. 12, 1978, abandoned. This application Feb. 4, 1981, Ser. No. 231,496**

**Int. Cl.³ A47B *88/00*; F16C *29/00***

**U.S. Cl. 312—334** **15 Claims**



1. A three-part sliding drawer suspension comprising outer, intermediate and inner channel-section rails each having channel sides and a channel bottom, outer and inner ball bearings each having a channel-section ball bearing cage having channel sides and a channel bottom between the outer and intermediate rails and between the intermediate and inner rails respectively; extension of the intermediate rail relative to the outer rail being limited by engagement of the end surfaces of the outer cage between a stop on the rear of the intermediate rail and a stop on the front of the outer rail, and retraction of the intermediate rail relative to the outer rail being limited by engagement of its rear stop with a stop on the rear of the outer rail; extension of the inner rail relative to the intermediate rail being limited by engagement of the end surfaces of the inner cage between a stop on the rear of the inner rail and a stop on the front of the intermediate rail, and retraction of the inner rail relative to the intermediate rail being limited by engagement of a stop on the front of the inner rail with the front stop on the intermediate rail; the cages being normally positioned so that the end surfaces of each cage are spaced at equal distances from the stop surfaces which they engage; abutment members on the outer rail and on the intermediate rail arranged for a small clearance between them and the rear and front ends of the outer bearing cage when in the normal position with the intermediate rail retracted relative to the outer rail, and for engaging an end of the outer cage when displaced forwardly or rearwardly from its normal position and for shifting the outer cage to its normal position on closing movement of the suspension; and an abutment member on the inner rail arranged for a small clearance between it and the front end of the inner bearing cage when in its normal position with the inner rail retracted relative to the intermediate rail, for engaging the front end of the inner cage when displaced forwardly from its normal position and for shifting the inner cage to its normal position on closing movement of the suspension; said abutment members on the outer and inner rails comprising tabs struck from the channel sides of the outer and inner rails for engaging the channel sides of the outer and inner cages, respectively, and the abutment member on the intermediate rail comprising a tab struck from the channel bottom of the intermediate rail for engaging the channel bottom of the outer cage.

---

**4,370,008**

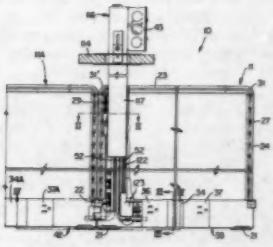
## WALL PANEL WITH PREWIRED POWER SYSTEM

**Richard G. Haworth, Holland; Charles J. Saylor, Zeeland, and Harold R. Wilson, Holland, all of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.**

**Continuation of Ser. No. 918,278, Jun. 22, 1978, abandoned, which is a continuation of Ser. No. 737,420, Nov. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,506, Sep. 22, 1975, Pat. No. 4,060,294. This application Apr. 23, 1980, Ser. No. 142,911**

**Int. Cl.³ H01R *13/00***

**U.S. Cl. 339—4** **30 Claims**



1. In a substantially free-standing interior wall system for dividing a large office area into smaller working areas, said wall system including a plurality of portable prefabricated upright panels, at least some of said panels being horizontally connected together in series so that the vertical end edges of said panels are positioned in close proximity to one another, and hinge means connected between the adjacent vertical end edges of adjacent panels for horizontally hingedly connecting said adjacent panels together to permit them to be horizontally angularly adjusted with respect to one another, the improvement comprising electrical power means formed as an integral part of said wall system for transmitting electrical energy to and between a group of said series-connected panels, said power means including:

first and second electrical terminal means fixedly mounted on each said panel of said group approximately adjacent the opposite end edges thereof in the vicinity of the lower corners of said panel, said electrical terminal means being

disposed substantially between a pair of substantially parallel vertical planes as defined by the opposite side surfaces of the respective panel;

raceway means fixedly connected to each said panel of said plurality and extending horizontally across said panel adjacent the lower edge thereof, said first and second terminal means being positioned adjacent the opposite ends of said raceway means, said raceway means extending across and having a width which approximately corresponds to the width of said panel, said raceway means including wall means defining a substantially closed interior passageway which extends horizontally of said panel between said first and second electrical terminal means for permitting communication cables or the like to pass therethrough:

cable means extending horizontally across each said panel, the opposite ends of said cable means being fixedly connected to said first and second electrical terminal means for permitting transmission of electrical energy therebetween;

each said terminal means having a pair of multiconductor connection means integrally associated therewith, the pair of connection means on said first terminal means being identical to the pair of connection means on said second terminal means, each said connection means defining one-half of a separable electrical connection, said pair of connection means as associated with each said terminal means being sidewardly spaced apart in the widthwise dimension of the panel but spaced laterally inwardly from the exterior sidewalls of said raceway means, whereby one connection means of said pair is positioned more closely adjacent one of the side surfaces of the panel and the other connection means of said pair is positioned more closely adjacent the other side surface of the panel;

flexible electrical connector means extending between and connected to the opposed pair of electrical terminal means as provided on first and second said panels which are disposed adjacent and horizontally series-connected for transmitting electrical energy between said first and second panels, said flexible electrical connector means including a pair of housing parts each having connecting means associated therewith and joined together by a center portion which permits said pair of housing parts to be horizontally angularly displaced relative to one another so as to accommodate the horizontal angular relationship between the series-connected first and second panels, each said connecting means being incompatible and not engageable with a conventional two- or three-conductor plug or socket, said flexible electrical connector means also including electrical conductor means extending through said center portion for electrically joining said pair of connecting means together, each of said connecting means defining one-half of said separable electrical connection and being slidably engageable with one of said connection means as associated with each electrical terminal means of said opposed pair, and said housing parts being disposed so as to not extend laterally outwardly of said raceway means when said connecting means and said connection means are joined together;

said flexible connector means being disposed substantially between or flush with parallel vertical planes as defined by the opposed sides of said first and second panels, one of said connecting means being slidably engaged with the connection means disposed adjacent said one side of said wall system and as associated with the electrical terminal means mounted on said first panel in close proximity to said second panel, the other said connecting means being slidably engageable with the connection means as disposed more closely adjacent said one side of said wall system and as associated with the electrical terminal means of said second panel as disposed in close proximity to said first panel, whereby said first and second panels are electrically joined together;

said flexible electrical connector means being electrically connectible between said opposed pair of terminal means by being alternatively releasably joined to either (1) the opposed pair of connection means as disposed more closely adjacent said one side of said wall system, or (2) the other opposed pair of connection means as disposed more closely adjacent the other side of said wall system, but not to both at the same time, whereby said flexible electrical connector means can be electrically connected between the opposed pair of electrical terminal means by being positioned adjacent either side of said wall system but not on both sides at the same time so as to permit any desired alignment or angularity between the series-connected panels;

one said electrical terminal means as associated with each panel also including a further connection means associated therewith for defining one-half of a plug-in type separable electrical connection, said further connection means being positioned in close proximity to and approximately between said pair of first-mentioned connection means, and elongated electrical cable means projecting vertically downwardly through an interior passageway in one of said panels and terminating at its lower end in another connection means defining one-half of said last-mentioned electrical connection, said another connection means being slidably engageable with said further connection means.

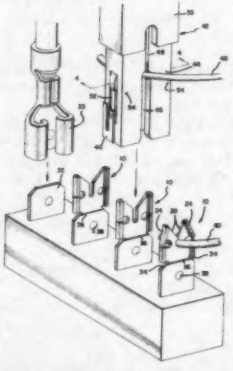
---

**4,370,009**

## SLOTTED PLATE TERMINAL RENEWABLE AS SPADE TERMINAL

**Frank P. Dola, Port Richey, Fla., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jul. 25, 1980, Ser. No. 172,046**
**Int. Cl.³ H01R 4/24**
**U.S. Cl. 339—31 R** **6 Claims**



**1.** A one piece stamped and formed electrical contact terminal having wire contacting means for establishing electrical contact with an insulated wire comprising:

a plate having a wire receiving end, a base portion, and opposed side edges,

said plate having a wire receiving slot extending inwardly from said wire receiving end toward said base portion, said slot having opposed walls spaced to make contact with the conductive core of an inserted wire, said slot having opposed lead-in ramps extending inwardly from said wire receiving end and converging toward said walls, said ramps defining a wire entry, said slot terminating at a bottom remote from said wire receiving end,

said plate having an indentation in at least one of said side edges opposite said slot and slightly offset from the bottom thereof toward said wire receiving end defining a

pivot section between said indentation and said slot, said indentation being configured as a linear slit extending laterally of said side edge to a circular aperture between said side edge and said pivot section, whereby,

said insulated wire may be moved laterally of its axis, through said wire entry and between said walls, displacing the insulation on the wire, until said wire reaches the bottom of the slot, said linear slit preventing distention of the wire receiving slot during wire insertion, whereupon a lateral force brought to bear against said side edge having said indentation therein will cause the section of said plate between said wire receiving end and said pivot section to deflect laterally about said pivot section and retain the wire in the bottom of the slot, said circular aperture preventing tensile fracture of said pivot section during lateral deflection of the section of plate between the wire receiving end and the pivot section.

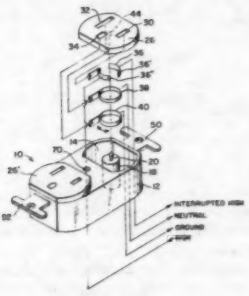
---

**4,370,010**

## QUICK CHANGE MULTIPLE FUNCTION OUTLET

**Robert L. Ordmandy, 43-26 159th St., Flushing, N.Y. 11358**

**Filed Nov. 3, 1980, Ser. No. 203,647**
**Int. Cl.³ H01R** *39/00*
**U.S. Cl. 339—31 R** **6 Claims**



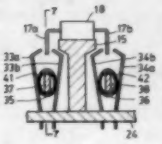

1. A multiple function outlet comprising, in combination, a casing having a receptacle well formed therein; a receptacle for fitting over and closing off said receptacle well, said receptacle and said receptacle well having similarly shaped configurations for mating engagement therebetween; said casing having means for pivotally connecting said receptacle in said receptacle well; and electrical contact means for electrical contact with said receptacle for alternately and optionally connecting said receptacle to a constant power source or to an intermittent power source, wherein said electrical contact means comprises a first circular contact ring; a second circular contact ring mounted adjacent to said first electrical contact ring; and a third electrical contact ring mounted adjacent to second electrical contact ring, wherein said receptacle comprises a first opening for insertion therethrough of a first wiper contact for contact with said first electrical contact ring; a second opening for insertion therethrough of a second wiper contact for contact with said second circular electrical contact ring, and a third opening for insertion therethrough of a third wiper contact for contact with said third circular electrical contact ring, whereby, when said receptacle is rotated, said third wiper contact is displaced so as to change the power source from a constant one to an intermittent one, wherein said third circular contact ring comprises a first semi-circular portion for connection to a constant power source and a second semi-circular portion for connection to an intermittent power source, whereby rotation of said third wiper contact from said first portion to said second portion changes the mode of operation from constant to intermittent.

**4,370,011**

## CONTACT DRIVE ASSEMBLY FOR USE WITH ELECTRONIC PART TEST EQUIPMENT

**Kenpei Suzuki; Shinichi Koya, and Hiroshi Sato, all of Gyoda, Japan, assignors to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan**

**Filed Oct. 31, 1980, Ser. No. 202,589**
**Claims priority, application Japan, Nov. 12, 1979, 54-146287**
**Int. Cl.³ H01R** *13/629*
**U.S. Cl. 339—74 R** **9 Claims**



1. A contact drive assembly for use with electronic part test equipment for testing an electronic part having at least one terminal pin, comprising:

holding means for holding the electronic part under test at a test position;

a stationary part;

at least one movable contact piece formed of a resilient conductive material and disposed with a top end thereof positioned opposite the terminal pin of the electronic part and fixed at the other end to the stationary part;

a flexible tube supported by the stationary part in close proximity to said at least one movable contact piece;

an elastic sealing tube within said flexible tube;

a compressed air source; and

compressed air control means, operatively connected between said elastic sealing tube and said compressed air source, for supplying compressed air from said compressed air source into said elastic sealing tube or discharging the compressed air from said elastic sealing tube, the compressed air being supplied into the sealing tube to perform sealing for the compressed air, so that when the compressed air is supplied into said elastic sealing tube, said flexible tube presses against said at least one movable contact piece to resiliently bias said at least one movable contact piece to engage with or disengage from the terminal pin, the amount of biasing of said at least one movable contact piece during the supply of the compressed air being determined by the inflation of said flexible tube.

---

**4,370,012**

## ELECTRICAL CONNECTOR FOR CIRCUIT BOARD OR SUBSTRATE

**Dimitry G. Grabbe, Lisbon Falls, Me., and Iosif Korsunsky, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

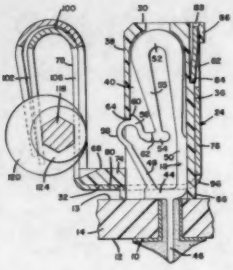
**Filed Nov. 20, 1980, Ser. No. 208,734**
**Int. Cl.³ H01R** *13/629*
**U.S. Cl. 339—75 MP** **8 Claims**

1. A circuit board or substrate edge connector of the type comprising housing means which is intended to receive edge portions of a circuit board and which contains contact terminals which engage, and establish contact with, terminal pads on one surface of said circuit board, said connector being characterized in that:

said housing means has a board engaging surface against which said circuit board is positioned when said edge portions of said circuit board are inserted into said housing means, said contact terminals having contact portions which normally extend beyond said board engaging surface and which are deflected towards said surface when said connector is assembled to said board;

said housing means having a board retaining portion which extends beside, and is spaced from, said board engaging surface, whereby a board receiving trough is formed between said board engaging surface and said board retaining portion,

board clamping means in said board retaining portion for clamping a circuit board having edge portions thereof disposed in said trough against said board engaging surface, said board clamping means comprising a cam shaft in said board retaining portion, said cam shaft extending parallel to said board engaging surface and having eccentric cam means thereon which engage the surface of said circuit board



which is the reverse surface from said one surface upon rotation of said cam shaft, said cam shaft being movable towards and away from said board engaging surface whereby,

upon insertion of said edge portions of said circuit board into said trough and engagement of said board clamping means with said circuit board, said circuit board is clamped against said board engaging surface and said contact portions of said contact terminals are engaged with said terminal pads, said connector being usable with circuit boards of widely varying thickness by virtue of the fact that said board clamping means is movable towards and away from said board engaging surface.

---

**4,370,013**

## CONNECTOR DEVICE FOR ELECTRIC CIRCUIT

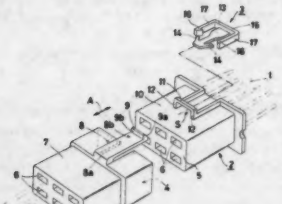
**Mitsugi Niitsu, Niiza; Shuichi Yamazaki, Kami-Fukuoka, and Shigeru Kimura, Kamakura, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Nifco, Inc., Yokohama, both of, Japan**

**Filed Sep. 2, 1980, Ser. No. 183,063**

**Claims priority, application Japan, Sep. 5, 1979, 54/121728[U]**

**Int. Cl.³ H01R *13/631***

**U.S. Cl. 339—82** **12 Claims**



1. A connector device for electric circuits comprising a pair of female and male connector housings of insulating material, one of said connector housings being provided with a resilient tongue piece possessing a check claw at the leading free end thereof and the other connector housing being provided with a crosspiece adapted to be engaged with said check claw, whereby the union of the pair of connector housings and the consequent electrical connection of a pair of opposed conducting terminals incorporated one each within the connector housings are attained by bringing the connector housings into mutual contact, causing the check claw at the leading end of said resilient tongue piece to slide into a vacant space under said crosspiece and thereafter enabling the check claw to come into fast engagement with the crosspiece by virtue of the resiliency of said resilient tongue piece, which connector device further comprises a lock means provided with an insertion piece having an entering end adapted to be inserted into said vacant space below the resilient tongue piece after the connector housings have been fastened to each other and a check means adjacent said entering end adapted to engage stop means on one of said housings to bring said insertion piece into inseparable engagement with at least one of the connector housings.

---

**4,370,014**

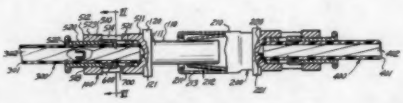
## INSULATED WIRE TERMINATION DEVICE

**Normand C. Bourdon, Unadilla, N.Y., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Nov. 7, 1980, Ser. No. 205,204**

**Int. Cl.³ H01R *11/20***

**U.S. Cl. 339—97 R** **18 Claims**



1. An insulation piercing contact for making good electrical and mechanical engagement with an associated insulated conductor wire, comprising:

a pair of conductive sleeves, said sleeves being telescopically interfittable with one another and slidably disposed for axial movement between first and second positions which define electrically unconnected and electrically interconnected positions respectively with the wire; and a deflectable cantilever arm extending outwardly from the inner of said telescoped sleeves, said cantilever arm having a pointed end to pierce through the insulation of the wire inserted with said inner sleeve, the outer of said telescoped sleeves having an opening for passing said cantilever arm outwardly to detain the two sleeves together in said first position and a cam disposed to urge against the cantilever arm and deflect the arm downwardly onto the wire and the pointed end into the wire when the second sleeve slides between the two axial positions.

---

**4,370,015**

## COAXIAL TAP CONNECTOR

**Harold G. Hutter, Brookfield, and Leonard J. Francis, Waterbury, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.**

**Filed Jan. 6, 1981, Ser. No. 222,846**

**Int. Cl.³ H01R *13/40***

**U.S. Cl. 339—97 P** **3 Claims**

1. An electrical connector for use with a coaxial cable of the type having a central conductor encircled by a dielectric support structure and an outer conductor comprising:

a body assembly having a generally U-shaped alignment cavity configured for snugly receiving said coaxial cable;

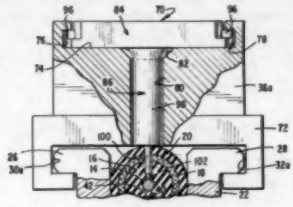
an elongate contact having a generally conically shaped cable piercing head and extending into said U-shaped alignment cavity from the base thereof, said cable piercing head being adapted for piercing an intact portion of said

coaxial cable received in said cavity and engaging said central conductor for making electrical connection therewith, the base of said cable piercing head being larger than the adjacent portion of said elongate contact for engaging said dielectric support structure and inhibiting separation of said cable piercing head and said central conductor;

first and second contact elements each adapted for piercing an intact portion of said coaxial cable received in said cavity and penetrating said outer conductor for making electrical connection therewith, said first and second contact elements extending into said U-shaped alignment cavity from the base thereof and being spaced on either side of said elongate contact;

cover means configured for securement to said body assembly and adapted for compressing said received coaxial cable within said U-shaped alignment cavity;

plunger means adapted for piercing said coaxial cable and engaging said central conductor directly opposite said



cable piercing head to further preclude movement of said central conductor away from said cable piercing head, and wherein said cover means includes means for securing said plunger means in abutment with said central conductor;

said plunger means including a head portion and a shank portion and said cover means including a bore extending therethrough for receiving said shank portion therein, said bore being aligned with said elongate contact, when said cover means are secured to said body assembly, to effect abutment of said shank portion against said central conductor; and

said cover means including a recessed portion for receiving said head portion, said recessed portion having a pair of opposed slide tracks and said head portion being rotatable in said recessed portion to engage said slide tracks over at least a portion of its rotation to secure said plunger means in said cover means.

---

**4,370,016**

## ELECTRICAL COUPLING DEVICES

**Derek Hayes, Home Farm Cottage, St. Michael, Bungay, Suffolk NR35 INF, England**

**PCT No. PCT/GB79/00213, § 371 Date Aug. 20, 1980, § 102(e) Date Aug. 15, 1980, PCT Pub. No. WO80/01339, PCT Pub. Date Jun. 26, 1980**

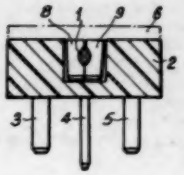
**PCT Filed Dec. 18, 1979, Ser. No. 199,509**

**Claims priority, application United Kingdom, Dec. 20, 1978, 49215/78**

**Int. Cl.³ H01R *13/58***

**U.S. Cl. 339—103 M** **13 Claims**

1. In an electrical coupling device comprising a housing, means within the housing for effecting electrical connection to one or more conductors of an electrical cable which enters the housing in use of the device and a cable grip for clamping the cable relative to the housing, the improvement according to which the cable grip comprises a pair of cooperating jaws adapted to receive the cable therebetween and camming means having a pair of opposed walls forming a receptacle of substantially rectangular cross section in the housing into which receptacle the pair of jaws with the cable therebetween can be pressed, said receptacle providing a longitudinal path for the cable between said jaws, said opposed walls being arranged to exert pressure on a pair of opposed surfaces of the pair of jaws to force the jaws towards one another with sufficient force to grip the cable and anchor it against longitudinal displacement in the jaws when the jaws are pressed into the receptacle by pressure in a direction substantially perpendicular to the path




of the cable through the jaws and to retain said jaws within the receptacle upon release of said pressure, and said housing comprising means to limit movement of the jaws in the direction of said path when a tensile force is applied longitudinally to the gripped cable in a direction tending to pull the cable out of the coupling device.

---

**4,370,017**

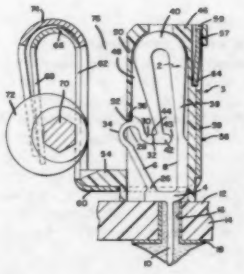
## COMPLANATE CONTACT TERMINAL

**Dimitry G. Grabbe, Lisbon Falls, Me., and Iosif Korsunsky, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Nov. 20, 1980, Ser. No. 208,724**

**Int. Cl.³ H01R *13/02***

**U.S. Cl. 339—176 MP** **10 Claims**



1. An electrical contact terminal of the type having a contact portion for engaging a terminal pad on a circuit board or the like, and spring means for maintaining said contact portion against said terminal pad, said terminal being characterized in that:

said terminal has a yoke portion, a contact arm, and a spring arm, said contact arm and said spring arm extending from said yoke portion and being side-by-side,

said contact arm having an electrical contact portion and a contact arm bearing portion, said electrical contact portion and contact arm bearing portion being spaced from said yoke portion and facing in opposite lateral directions, said contact arm bearing portion being directed towards said spring arm,

said spring arm having a spring arm bearing portion spaced from said yoke portion and directed towards, and in alignment with, said contact arm bearing portion,

said contact arm comprising a cantilever beam having a free end portion, said electrical contact portion and said contact arm bearing portion being proximate to said free

end portion, an extension on said free end portion of said contact arm extending towards said spring arm, said contact arm bearing portion being on the end of said extension,

said terminal being complanate and having been manufactured from flat stock metal by removing portions of the stock metal, said arms and said yoke portion having extensive parallel side surfaces and narrow edge surfaces extending between said side surfaces, said bearing portions and said electrical contact portion being on said edge surfaces whereby,

upon application of a contact force against said contact portion of said contact arm when said terminal pad is moved against said contact portion, said contact arm is moved towards said spring arm, and said spring arm is flexed and develops contact force for maintaining said contact portion against said terminal pad.

---

**4,370,018**

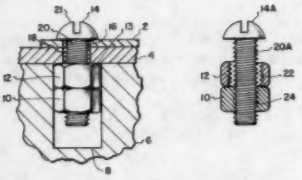
## UNIVERSAL TERMINAL BLOCK CONNECTOR

**Charles E. Lane, III, Meadowbrook, Pa., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 13, 1980, Ser. No. 206,612**

**Int. Cl.³ H01R *9/10***

**U.S. Cl. 339—263 R** **10 Claims**



**1.** A terminal block connector comprising:

a first nut having a first thread diameter,

a second nut having a second thread diameter larger than said first thread diameter,

a support block and

a recess in said block rotationally capturing said first nut and said second nut therein in a mutually coaxial relationship with each other and with said recess, said first nut being freely axially separable from said second nut within said recess, and with said second nut being positioned at an entrance to said recess and said first nut being located subsequent to said second nut in said recess with respect to the entrance to said recess.

---

**4,370,019**

## OPTICAL SCANNING DEVICE WITH TEMPERATURE CONTROL MEANS

**Takayuki Shirasaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,845**

**Claims priority, application Japan, Dec. 23, 1978, 53-163272; Dec. 23, 1978, 53-163273; Dec. 23, 1978, 53-163274; Aug. 28, 1979, 54-109458**

**Int. Cl.³ G02B *27/17*; H02K *33/00*; H02D *5/06***

**U.S. Cl. 350—6.6** **16 Claims**

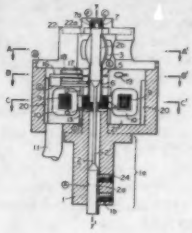
**1.** An optical scanning device, comprising:

a mirror for light scanning;

a motor including an armature and a stator;

a torsion member, said mirror being mounted with said torsion member and said armature being mounted on said torsion member to be rotated by said motor, said torsion member being adapted for generating a restituting force against the driving force of said motor to limit the rotating angle of said armature and thereby, said mirror;

temperature detecting means disposed opposite said torsion member for detecting the temperature around said torsion member; and



temperature control means disposed opposite said torsion member for controlling the atmosphere around said torsion member in response to the detection output of said detecting means.

---

**4,370,020**

## TRANSPORTABLE FIBRE OPTIC APPARATUS FOR USE IN A SECURITY SYSTEM

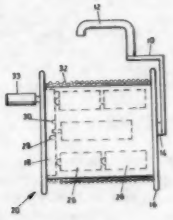
**James W. Davey, 40 Grenville Ave., Savoy Estates, Johannesburg, Transvaal, South Africa**

**Filed Jun. 25, 1980, Ser. No. 162,837**

**Claims priority, application South Africa, Jul. 10, 1979, 79/3456**

**Int. Cl.³ G02B *5/14*; G08B *13/18***

**U.S. Cl. 350—96.10** **5 Claims**



**1.** A transportable unit for use in a security system, the unit comprising an axle and a handle for supporting the axle, a reel, rotatably mounted on the axle, on which a length of optic fibre is coiled and from which the optic fibre can be drawn as required, a transmitter for transmitting an optical signal along the length of optic fibre, and detecting means connectable to the optic fibre to detect said optical signal.

---

**4,370,021**

## COUPLING ELEMENT FOR AN OPTICAL TRANSMISSION FIBER

**Giok D. Khoe; Robert G. Gossink, and Cornelis M. G. Jochem, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Division of Ser. No. 913,293, Jun. 7, 1978. This application Jun. 13, 1980, Ser. No. 159,274**

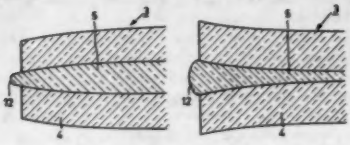
**Claims priority, application Netherlands, Jun. 10, 1977, 7706379**

**Int. Cl.³ G02B *5/14***

**U.S. Cl. 350—96.18** **3 Claims**

**1.** A coupling element, for coupling a radiation source to a monomode optical transmission fiber having a core and a cladding, comprising a semi-ellipsoidal lens formed as a unitary

mass with the fiber core on an end of the fiber, said fiber core having a viscosity of $10^7$ to $10^{8.5}$ poises and said fiber cladding having a viscosity of $10^{10}$ to $10^{11}$ poises at a temperature at which the lens is formed.



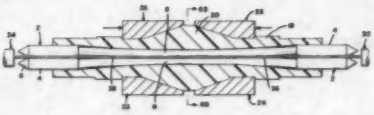
---

**4,370,022**

## BICONICAL OPTICAL WAVEGUIDE SPLICE

**Tore R. Johnson, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Aug. 1, 1980, Ser. No. 174,319**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.21** **13 Claims**



1. A fiber optic connector for connecting ends of optical waveguide members, comprising:

tubular body means having an axial profiled passageway means extending therethrough and an external profile including peripheral step means;

rod means disposed in said axial profiled passageway means, said rod means including larger diametered ends and smaller diametered intermediate segments, said larger diametered ends being in engagement and located within end sections of said passageway means, said smaller diametered intermediate segments extending along said axial profiled passageway means and normally spaced from each other, said rod means providing interstitial passageway means therealong and along which the optical waveguide members are positioned with their ends adjacent each other;

crimping collar means disposed on said external profile for movement relative to said tubular body means thereby applying radial compression forces to said tubular body means causing inward radial deflection of said smaller diametered intermediate segments onto the optical waveguide members.

---

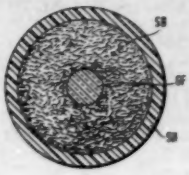
**4,370,023**

## LONGITUDINAL WATER-TIGHT LIGHT WAVEGUIDE CABLE AND THE METHOD OF MANUFACTURE

**Gerhard Lange, and Helmut Saller, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 30, 1980, Ser. No. 202,348**
**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2946027**
**Int. Cl.³ G02B 5/14, 5/16**
**U.S. Cl. 350—96.23** **31 Claims**

1. In a light waveguide cable having at least one fiber-shaped light waveguide being arranged in an interior of a protective sheath and the remaining inside space of the sheath being filled with a gel-like substance, the improvement being said gel-like substance being a mixture of an oil, an organic thickener and a thixotropic agent, said thickener comprising polymers selected from a group consisting of halogenated hydrocarbon polymers, halogen-free hydrocarbon polymers and mixtures of halogenated and halogen-free hydrocarbon polymers.



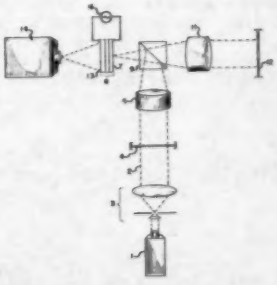
---

**4,370,024**

## DYNAMIC BINARY FOURIER FILTERED IMAGING SYSTEM

**Harry L. Task, Montgomery County, Ohio; John F. Courtright, Windcrest, Tex., and Casimer K. Salys, Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed May 6, 1980, Ser. No. 147,417**
**Int. Cl.³ G02B 5/18**
**U.S. Cl. 350—162.12** **1 Claim**



1. An apparatus for selectively and dynamically filtering the spatial frequencies in a pattern, comprising:

a means for generating a collimated beam of coherent light;

a means for creating a diffraction pattern in said beam;

a Fourier transform lens system in the path of said patterned beam;

a dynamic means for spatially and temporally varying the reflective characteristics of a surface at the focal plane of said Fourier transform lens system, said dynamic means having a continuously reflective area at the point corresponding to zero spatial frequency; and

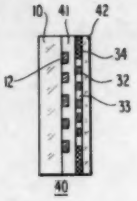
a means for redirecting the light, reflected off the surface of said dynamic means, onto an image plane.

4,370,025

## MULTICOLOR OPTICAL FILTER WITH A UNITED INTERFERENCE FILTER AND DYE FILTER AND PROCESS FOR MAKING THE SAME

Masamichi Sato; Kenji Matsumoto, both of Asaka, and Kazuhisa Seki, Omiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Fuji Photo Optical Co., Ltd., Saitama, both of, Japan

Filed Dec. 24, 1980, Ser. No. 219,655
Claims priority, application Japan, Dec. 27, 1979, 54-173836
Int. Cl.[3] G02B *5/22, 5/28;* G03C *5/00;* H01J *29/02*
U.S. Cl. 350—166 5 Claims




1. A multicolor optical filter comprising

an interference filter composed of a transparent substrate having thereon regularly arranged interference layers with desired optical characteristics and

a dye filter composed of a transparent substrate having a binder layer containing therein regularly arranged dye or dyes having different optical characteristics from those of said interference filter,

said interference filter being united with said dye filter in such a manner that the filter surface of the former faces the filter surface of the latter.

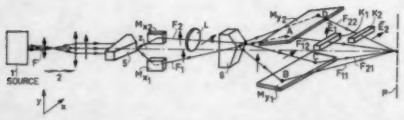
---

4,370,026

## ILLUMINATING DEVICE FOR PROVIDING AN ILLUMINATION BEAM WITH ADJUSTABLE DISTRIBUTION OF INTENSITY AND A PATTERN-TRANSFER SYSTEM COMPRISING SUCH A DEVICE

Georges Dubroeucq; Michel Lacombat, and Michele Brevignon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 8, 1980, Ser. No. 184,817
Claims priority, application France, Sep. 10, 1979, 79 22587
Int. Cl.[3] G02B *27/10;* G03B *27/72*
U.S. Cl. 350—163 2 Claims




1. An illuminating device intended to supply a coherent illumination beam having an adjustable spatial distribution of intensity, from a source providing an initial beam having a gaussian distribution of intensity comprising means for separating the initial beam into four parts each forming a beam, along two radial directions perpendicular to each other, means for recombining the four parts resulting in a predetermined plane in partial superimposition of the four beams and means for averaging the interferences beween the four parts so that the mean intensity in the predetermined plane is equal to the sum of the mean intensities of the four parts wherein the separating means comprises a first biprism centered on the path of the initial beam and separating it along a first radial direction into two half-beams symmetrical with respect to the axis of the initial beam, and a second biprism centered on the path of the two half-beams and separating them respectively in a second radial direction perpendicular to the first one, into first and second parts symmetrical with respect to the first half-beam and into third and four parts symmetrical with respect to the second half-beam,

wherein said recombining means comprises first and second mirrors reflecting respectively the two half-beams in two directions symmetrical with respect to the axis of the initial beam and converging towards the second biprism, and third and fourth mirrors reflecting respectively the two former parts and the two latter parts in four directions symmetrical with respect to the axis and converging towards the predetermined plane, and

wherein, with the initial beam polarized linearly, the averaging means comprise at least one birefringent blade situated in the path of one of the half-beams so that these two-half beams have polarization directions perpendicular to each other, and at least two electrooptical phase-shifting situated respectively in the paths of one of the two former parts and of one of the two latter parts and introducing between the two former parts on the one hand and between the two latter parts on the other hand predetermined phase shifts variable in time, whose mean values, for times which are short with respect to the illumination duration, are zero.

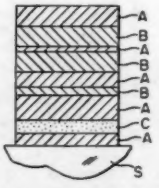
---

4,370,027

## ANTI-REFLECTION FILM WITH AN ION-PENETRATION PREVENTION LAYER

Masatoshi Sato, and Yosuke Takahashi, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 869,240, Jan. 13, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,791
Claims priority, application Japan, Jan. 20, 1977, 52-4496
Int. Cl.[3] G02B *1/10*
U.S. Cl. 350—164 7 Claims




1. An anti-reflection film on a glass substrate containing $Na^+$ or $Pb^{++}$ ions, comprising:

a low refractive index substance layer disposed on said glass substrate;

a high packing density layer formed of a substance of which a packing density is so high as to prevent penetration of said ions, said high packing density layer being disposed on said low refractive index substance layer; and

plural pairs of layers A and B superimposed on said high packing density layer in the order of ABAB from the high packing density layer, where A is a low refractive index substance layer; and B is a high refractive index substance layer.

4,370,028

## METHOD OF PRODUCING LIQUID CRYSTAL DISPLAY DEVICES WITH ALIGNMENT LAYER FORMED FROM ORGANIC TIN COMPOUND OF THE TYPE $R_nSnX_{4-n}$

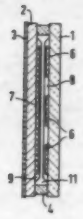
Joerg Bernhardt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 220,075

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1980, 3001125

Int. Cl.³ G02F 1/133

U.S. Cl. 350—341 13 Claims



1. In a method of producing a liquid crystal display device comprised of two carrier plates which enclose a liquid crystal layer therebetween and each plate is provided with an electrically conductive coating (electrode) on a respective surface thereof facing one another and provided with an orientation layer thereabove, the improvement comprising wherein:

said orientation layer is generated from an organic tin compound of the type:

$$R_nSnX_{4-n}$$

wherein R is an organic radical, X is a reactive residual radical and n is an integer ranging from 1 to 3.

---

4,370,029

## DIELECTRIC INTERFACE FOR PROXIMITY COUPLED ELECTRO-OPTIC DEVICES

Robert A. Sprague, Saratoga; William D. Turner, San Marino, and David H. Hartke, Los Angeles, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1980, Ser. No. 187,919

Int. Cl.³ G02F 1/01

U.S. Cl. 350—355 10 Claims

1. In an electro-optic device including

an electro-optic element,

a plurality of electrodes intimately coupled to said electro-optic element, and

means coupled to said electrodes for applying voltages thereto, whereby electric fields are created within said electro-optic element;

the improvement comprising

a substrate, at least one of said electrodes being supported by said substrate,

means engaged with said electro-optic element and with said substrate for maintaining said substrate supported electrodes within a small gap distance of said electro-optic element, thereby proximity coupling said substrate supported electrodes to said electro-optic element, and

a dielectric disposed within said gap, said dielectric substantially filling said gap and having a relative dielectric constant which is substantially greater than 1, whereby said dielectric enhances said proximity coupling.

---

4,370,030

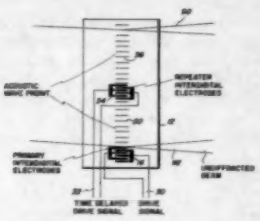
## EXTENDED RESOLUTION LIGHT DEFLECTOR USING SURFACE ACOUSTIC WAVES

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1980, Ser. No. 153,380

Int. Cl.³ G02F 1/11

U.S. Cl. 350—358 11 Claims



1. In an acousto-optic device comprising a piezo-electric substrate (12) having relatively flat sides, a first set of interdigital electrodes (60) on one side of the substrate (12), said electrodes introducing on the surface of said substrate acoustic waves (62) in response to a predetermined electrical deflector signal (80, 82) applied to said interdigital electrodes, an illuminating light beam (10) introduced into said substrate (12) through a side adjacent to the side with said interdigital electrodes (60), said beam directed at said side at an angle such that the light beam suffers total internal reflection near grazing incidence off the active surface where the acoustic waves (62) are generated, in a plane perpendicular to the direction of travel of the acoustic waves, the output beam being reflected from the active surface containing the acoustic waves and leaving said substrate through the remaining portion of said substrate in a zero order undiffracted direction (92) and a first order diffracted direction (90), wherein the improvement is characterized by:

a second set of interdigital electrodes (72) on the same side of said substrate as said first set of interdigital electrodes (60) and in the path of said acoustic waves introduced on the surface of said substrate by said first set (60) of interdigital electrodes, said second set of interdigital electrodes being positioned in said path of said acoustic waves so as to introduce new acoustic waves of the same frequency and in phase with and thereby amplifying the acoustic waves (62) introduced by said first set of interdigital electrodes.

---

4,370,031

## ZOOM OBJECTIVE OF SMALL SIZE

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,721

Claims priority, application Japan, Jul. 24, 1979, 54-94088

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.³ G02B 15/16

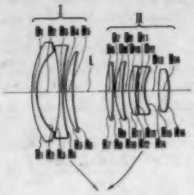
U.S. Cl. 350—426 7 Claims

1. A zoom objective of small size including:

a divergent lens group consisting of a negative meniscus lens having a front surface convex toward the front, a negative lens and a positive lens having a front surface of strong curvature convex toward the front, and axially movable for zooming, and

a convergent lens group including three positive lenses and

a negative lens followed by a positive lens, positioned on the image side of said divergent lens group and axially



movable for zooming independently of said divergent lens group, said zoom objective fulfilling the following requirements:

$$1.08 \leqq \frac{|Fl|}{Ft} < 1.255 \quad (1)$$

$$0.08 < \frac{Et}{Ft} < 0.195 \quad (2)$$

(3) $\nu 3 < 35$

(4) $32 <$ (At least either one of $\nu 1$ and $\nu 2$) $< 45.5$

$$1.64 < \frac{N4 + N5}{2} < 1.76 \quad (5)$$

Where Fl is the focal length of the divergent lens group; Ft is the longest focal length of the entire system; Et is the interval between the principal points of the divergent and the convergent lens groups when in the telephoto end; $\nu 1$, $\nu 2$ and $\nu 3$ are the Abbe numbers of the three lenses in the divergent group; and N4and N5 are the refractive indices of the first two lenses counting from the front in the convergent lens group respectively.

---

**4,370,032**

**PROJECTION LENS**

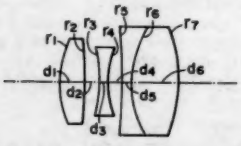
**Masamichi Tateoka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 22, 1980, Ser. No. 199,660**

**Claims priority, application Japan, Oct. 29, 1979, 54-140043**

**Int. Cl.³ G02B *9/14***

**U.S. Cl. 350—476** **8 Claims**



1. A projection lens comprising three groups of four components, said three groups comprising a first group from the front consisting of a biconvex single lens, a second group consisting of a biconcave single lens and a third group consisting of a positive lens comprising a negative lens and a positive lens cemented together, said projection lens satisfying the following conditions:

$f = 1$, $F = 1{:}4$, Angle of view $= 42°$, $\beta = -0.0893$

| | | | |
|---|---|---|---|
| $r_1 = 0.392$ | $d_1 = 0.0919$ | $n_1 = 1.69401$ | $\nu_1 = 54.8$ |
| $r_2 = -6.9124$ | $d_2 = 0.0592$ | | |
| $r_3 = -0.7147$ | $d_3 = 0.0254$ | $n_2 = 1.61686$ | $\nu_2 = 37.0$ |
| $r_4 = 0.3442$ | $d_4 = 0.063$ | | |

-continued

$f = 1$, $F = 1{:}4$, Angle of view $= 42°$, $\beta = -0.0893$

| | | | |
|---|---|---|---|
| $r_5 = -6.4695$ | $d_5 = 0.0404$ | $n_3 = 1.70443$ | $\nu_3 = 30.1$ |
| $r_6 = 0.3656$ | $d_6 = 0.1675$ | $n_4 = 1.81077$ | $\nu_4 = 40.9$ |
| $r_7 = -0.6089$ | | | |

where f is the focal length, F is the F-number, $\beta$ is the magnification of the projection lens, $r_1$ through $r_7$ represent the curvature radii of the successive lens surfaces, $d_1$ through $d_6$ represent the thicknesses of the respective lenses and the intervals between adjacent lenses, $n_1$ through $n_4$ represent the refractive indices of the respective lenses for E-line, and $\nu_1$ through $\nu_4$ represent the abbe's numbers of the respective lenses.

---

**4,370,033**

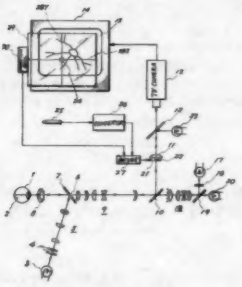
**EYEBALL EXAMINING DEVICE**

**Kazutaka Kani, Motoryamanakamachi; Kuniomi Abe; Masahiko Konagaya, both of Kobe, and Noboru Ono, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Hyogo, Japan**

**Filed Oct. 15, 1979, Ser. No. 84,816**

**Int. Cl.³ A61B *3/14, 3/10*; G03B *29/00***

**U.S. Cl. 351—206** **6 Claims**



1. An eyeball examining device, comprising a television pick-up camera, a main optical system including an image plane for focusing an eye ground image on said plane and on said television camera, an infrared ray source, means for directing infrared rays from said source to the eye ground and a television monitor for displaying the image picked up by said television camera, said device further comprising an optical infrared filter pattern located in the eye ground image plane of said main optical system, means for moving said pattern in said image plane and a light source for illuminating said optical pattern and imaging it on said eye ground for display on said television monitor.

---

**4,370,034**

**OPHTHALMOLOGICAL INSTRUMENT OF CONTINUOUSLY VARIABLE MAGNIFICATION**

**Masao Nohda, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Jul. 15, 1980, Ser. No. 169,104**

**Claims priority, application Japan, Jul. 20, 1979, 54-92331**

**Int. Cl.³ A61B *3/14*; G03B *29/00***

**U.S. Cl. 351—206** **6 Claims**

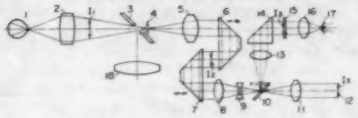
1. An ophthalmological apparatus capable of changing the magnification of an image to be observed and maintaining an eye point unchanged when the magnification is changed, comprising:

(a) an image forming means for forming a first image to be observed;

(b) a diopter correcting means for keeping the position of

said first image constant irrespective of the diopter of the eye to be examined;

(c) a magnification changing optical system for forming a second image from said first image and changing the size of said second image, said magnification changing means having movable lens groups which are movable relative to each other in the direction of optical axis; and



(d) an optical path length correcting means for correcting an optical path length between the anterior and the posterior focal points of said magnification changing optical system, said optical path length correcting means including reflecting member movable along the optical axis of said magnification changing optical system in association with the movement of said movable lens groups to reflect the light beam from said first image to said magnification changing optical system.

---

**4,370,035**

## DUAL WEB SOUND MOVIE CASSETTE WITH EMULSION STRIPPING WEB

**Joseph A. Stella, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

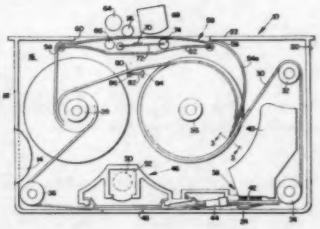
**PCT No. PCT/US79/00761, § 371 Date May 21, 1980, § 102(e) Date May 21, 1980, PCT Pub. No. WO80/00752, PCT Pub. Date Apr. 17, 1980**

**Continuation-in-part of Ser. No. 947,769, Oct. 2, 1978, Pat. No. 4,170,407. This PCT application Sep. 24, 1979, Ser. No. 278,908**

**The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.**

**Int. Cl.³ G03B *23/02***

**U.S. Cl. 352—78 R** **4 Claims**



1. In a photographic film cassette (10) having a film strip (30) coupled at opposite ends to cassette-contained supply and takeup spools (26, 28) upon which the film strip (30) may be alternately wound and unwound for movement between the spools in a first path through a photographic station, the film strip (30) including an emulsion surface, the cassette (10) including a processing station (38) operative after film exposure to deposit a thin layer (30p) of processing fluid on the emulsion surface of the film strip, the film strip having a carrier base (86) to support a plurality of layers including a light sensitive emulsion acted upon by the processing fluid and positive image forming layers located between the carrier base and the light sensitive emulsion, the cassette (10) further including an audio tape (54) coupled at one end to at least one of said spools (26, 28) for interwinding thereon with the film strip (30) and the audio tape (54) in an interleaved manner interposed between the audio tape (54) and said emulsion surface of said one side of the film strip (30), the stripping and separating web (80) being movable from the one spool in a third path separate from the first and second paths so that during rewinding and processing of the film strip (30) in convolutions on the supply spool (26), said stripping web (80) overlies the inner layers of the film strip (30) now wetted with processing fluid and upon subsequent unwinding of both the film strip (30) and said stripping web (80) and corresponding travel in their separate paths, diverging separation of said stripping web (80) from the film strip (30) causes at least a portion of the light sensitive emulsion to be retained by adhesion on said stripping web (80).

a stripping and separating web (80) of thin flexible material having one end coupled to said one spool for interwinding

---

**4,370,036**

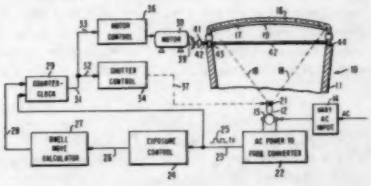
## SYSTEM AND METHOD FOR INTERMITTENTLY MOVING A PICTURE TUBE PANEL ON A LIGHTHOUSE

**William R. Kelly, and Ernesto J. Alvero, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed May 28, 1981, Ser. No. 267,991**

**Int. Cl.³ G03B *41/00***

**U.S. Cl. 354—1** **11 Claims**



1. In a lighthouse used for exposing an actinic energy sensitive coating present on the inside surface of a picture tube panel with energy from an actinic energy source, an improved system for effecting intermittent relative motion between said panel and said energy source comprising:

support means for supporting said picture tube panel for relative movement between said panel and said energy source;

motor means for actuating said support means to effect relative motion between said panel and said energy source;

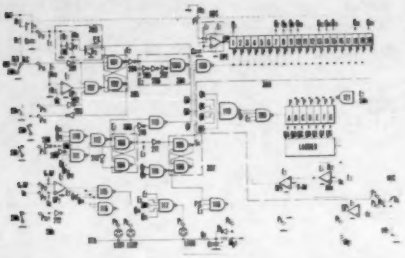
means for providing a control signal having a frequency related to the intensity of said actinic source;

control means for intermittently moving and stopping said relative motion for predetermined numbers of motion and dwell intervals during the exposure of said coating to said actinic energy, said control means including means for providing a signal representative of the total distance of said relative motion; and a dwell-move calculator for receiving said control signal and providing said motion and dwell intervals.

## 4,370,037
## DIGITAL CONTROL CAMERA

Masanori Uchidoi, Yokohama; Tomonori Iwashita, Fuchu; Tetsuya Taguchi, Kawasaki; Yukio Iura, Yokosuka; Toshikazu Ichiyanagi, Tokyo, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 733,794, Oct. 19, 1976, Pat. No. 4,265,521. This application Mar. 16, 1979, Ser. No. 21,188
Claims priority, application Japan, Oct. 21, 1975, 50-126559
The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.
Int. Cl.[3] G03B *9/08*
U.S. Cl. 354—23 D 15 Claims

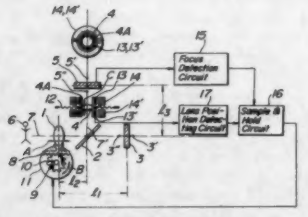


10. A camera, comprising:
(a) a light measuring circuit for producing an electrical signal corresponding to the brightness of an object;
(b) a memory circuit for memorizing an electrical signal corresponding to the electrical signal of the light measuring circuit;
(c) a shutter mechanism;
(d) a photographic control circuit having an exposure control circuit for controlling an exposure factor on the basis of the electrical signal memorized in the memory circuit and for producing a closing signal for closing the shutter mechanism at an end of a film exposure, said photographic control circuit including means for producing a reset signal to reset the electrical signal memorized in the memory circuit when the shutter mechanism is operated.

## 4,370,038
## AUTOMATIC FOCUSSING SYSTEM

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,592
Claims priority, application Japan, Dec. 2, 1980, 55-169828
Int. Cl.[3] G03B *3/10*; H04N *5/26*; G01J *1/44*
U.S. Cl. 354—25 11 Claims

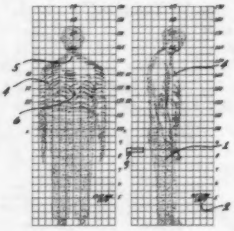



1. A system for automatically driving an objective lens provided in a still camera, a television camera and the like into a desired focus position so as to form a focussed image of an object onto a predetermined focal plane comprising:
an auxiliary lens for receiving at least a part of a light flux transmitted through said objective lens and arranged movably along an optical axis;
a photo detector arranged to receive an image formed by said auxiliary lens to produce an electric signal;
means for vibrating repeatedly said auxiliary lens along the optical axis about a reference position which is conjugated with said predetermined focal plane;
means for detecting a position of said auxiliary lens to produce a lens position signal representing a deviation of the auxiliary lens with respect to the reference position;
means for receiving said electric signal from the photo detector to derive timings at which the best focussed condition is obtained during the vibration of the auxiliary lens to produce a sampling signal at said timings;
means for receiving said lens position signal and sampling signal to sample and hold the lens position signal by the sampling signal to produce a driving signal; and
means for receiving the driving signal to move the objective lens into said desired focal position.

## 4,370,039
## METHOD AND APPARATUS FOR PHOTOGRAPHICALLY MEASURING AN OBJECT

Ulrich M. Landwehr, Buersche Strasse 4, 4520 Melle 1, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,237
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948010; Jun. 2, 1980, 3020901
Int. Cl.[3] G03B *15/00, 29/00*
U.S. Cl. 354—77 13 Claims



7. An apparatus of the characteristics described, comprising:
a photographic camera directed toward a particular field of view;
a stage means in the field of view;
a vertical partition centrally disposed on the stage means and having a front edge;
a plate hinged to said edge and carrying a grid pattern on both sides of the plate provided for covering one half of the other half of the stage means; and
projection means for projecting a line pattern into the other half or the one half of the stage means not covered by the plate.

## 4,370,040
## REMOVABLE LINK FOR A CARRYING STRAP

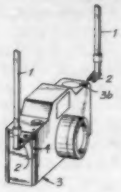
Karl-Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG, Bunde, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,338
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034123
Int. Cl.[3] G03B *17/02*
U.S. Cl. 354—288 12 Claims

1. An assembly for mounting a member to the wall of a camera body, comprising
a substantially planar link having a forward linking end and a rear mounting end for receiving the member, the link

formed with a passage therethrough which extends into an opening slit in the linking end, the width of the opening slit being less than the largest dimension of the passage, and

a locking pin displacable in a direction transverse to the link, the locking pin being a stepped pin having a first dimension smaller than the width of the opening slit of the link



and a second larger dimension greater than the width of the opening slit and smaller than the largest dimension of the passage,

the pin mounted within the camera wall and the outer surface of the camera wall formed with a cooperating slot for receiving the link, the pin adapted to be positioned through the passage in the link.

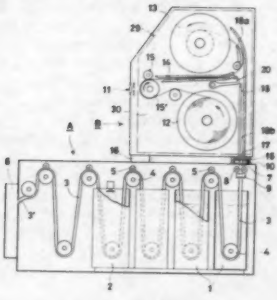
---

**4,370,041**

## COMBINATION PHOTOGRAPHING AND DEVELOPING APPARATUS

**Tsutomu Katsuyama, Yokohama, Japan, assignor to Mochizuki Shoten, Limited, Yokohama, Japan**

**Filed Oct. 19, 1981, Ser. No. 312,714**
**Int. Cl.³ G03B *17/50***
**U.S. Cl. 354—92** **9 Claims**



1. In a combination photographing and developing apparatus operated by mounting in the photographing section thereof a roll of film wound on a payoff reel, advancing the film from the payoff reel along a guide route by a film feed means, effecting photography by exposing the film to given data, cutting the film with a cutter behind the end of the exposed portion thereof, forwarding the exposed portion of the film, with the cut end in the lead, through the outlet of the photographing section to the inlet of the developing section, and leading the film along a developing route passing through developing, fixing, and washing liquid tanks and a drying means in the developing section thereby effecting the development and drying of the film, the improvement wherein the photographing section thereof comprises in combination a storage reel disposed before said guide route and adapted to be selectively advanced in the forward or rearward direction, means for rotating said storage reel in the forward direction synchronously with the photographing operation, said forward rotation of the storage reel enabling the exposed portion of the film to be rewound on the storage reel, a vertical guide route formed between said storage reel and the outlet for the exposed portion of the film, said guide route having the leading end thereof join said vertical guide route halfway along the length thereof, a cutter disposed between the position for film exposure and the leading end of said guide route and adapted to cut the film behind the exposed portion thereof, and means for advancing the exposed portion of the film, with the cut tail end thereof in the lead, through said vertical guide route toward the outlet.

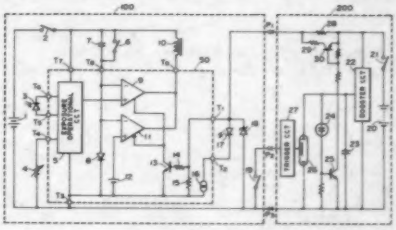
---

**4,370,042**

## READY-TO-FLASH CONDITION INDICATING DEVICE FOR A CAMERA

**Yuji Ohkubo, Ohmiya, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed May 4, 1981, Ser. No. 260,382**
**Claims priority, application Japan, Jun. 3, 1980, 55-76891[U]**
**Int. Cl.³ G03B *15/05, 7/26***
**U.S. Cl. 354—127** **4 Claims**



1. A device for use with an electronic flash device in a camera, comprising; a light-emitting element driven by a signal current from said electronic flash device for indicating the ready-to flash condition of said electronic flash device; a current control circuit series-connected to said light-emitting element to control a current flowing to said light-emitting element, an integrated circuit operative in response to said signal current from said electronic flash device; and a limiting circuit for detecting a voltage related to the combined voltage of said light-emitting element and said current control circuit and limiting said combined voltage to below a predetermined value when said detected voltage exceeds a predetermined value.

---

**4,370,043**

## PHOTOGRAPHING OPERATION CONTROL DEVICE FOR CAMERA

**Isao Harigaya, Yokohama, and Hideo Tamamura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

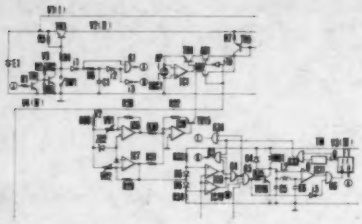
**Continuation of Ser. No. 4,270, Jan. 19, 1979, abandoned. This application Feb. 11, 1981, Ser. No. 233,335**
**Claims priority, application Japan, Jan. 20, 1978, 53-5459; Jan. 20, 1978, 53-5460**
**Int. Cl.³ G03B *1/18, 7/00*; B03B *13/20*; G03B *17/40***
**U.S. Cl. 354—173** **16 Claims**

1. A camera comprising:

(a) automatic focusing means for automatically adjusting the focus of a lens system of the camera;

(b) detecting means for detecting the focus adjusting operation by means of the automatic focusing means, and producing a signal when the focus adjusting operation is properly performed; and

(c) signal forming means for producing a signal for permitting a shutter release operation when the signal of the



detecting means is produced for more than a certain determined time.

---

**4,370,044**

**ELECTRIC WIND-UP DEVICE OF A CAMERA**

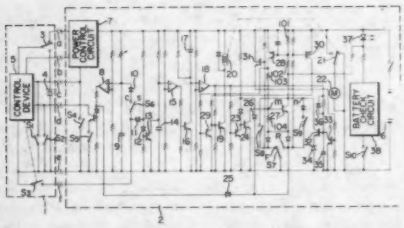
**Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Continuation of Ser. No. 117,805, Feb. 1, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,821**

**Claims priority, application Japan, Feb. 7, 1979, 54-13004**

**Int. Cl.³ G03B *1/18***

**U.S. Cl. 354—173** **5 Claims**




1. An electric wind-up device for a camera for winding up a film by a motor after exposure has been completed by shutter means closing an aperture, said shutter means having a shutter opening member operable for opening said aperture and a shutter closing member operable for closing said aperture for enabling a predetermined exposure time control, said device comprising:

(a) switch means responsive to said shutter closing member to operate during the time from after the operation of said shutter closing member to before the exposure is completed; and

(b) means for emitting a film advance signal for driving said motor, said emitting means including a delay circuit operable by said switch means to emit said signal when a predetermined time substantially corresponding to the time from said operation of said switch means to the completion of said exposure elapses.

---

**4,370,045**

**FILM PROCESSOR**

**William A. Holmes, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Mar. 1, 1982, Ser. No. 353,429**

**Int. Cl.³ G03D *5/06***

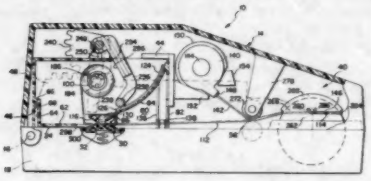
**U.S. Cl. 354—304** **20 Claims**

1. Apparatus for receiving a film cassette containing a roll of exposed, self-developing type transparency film preparatory to processing the film, the roll of film being wound upon a rotatable spool with one end of the film being secured to the spool and its opposite econd end being adapted to extend to the exterior of the film cassette via a film withdrawal slot, said apparatus comprising:

a housing defining a lighttight enclosure in which photographically exposed film is adapted to be processed, said housing including a loading door providing access to the interior of said housing;

means for locating a film processing kit within said housing, the kit including a housing containing a strip of flexible sheet material wound about a rotatable drum with a first end attached to the drum and its opposite second end extending to the exterior of the kit, a rupturable container enclosing a supply of processing liquid, and a processing liquid dispenser which is adapted to apply a coating of processing liquid to one side of the sheet material as it is being withdrawn from the kit;

means for supporting the film cassette containing the exposed roll of film;



means for releasably receiving the second ends of the film and sheet material, said receiving means being adapted to be driven in a direction so as to withdraw the film and sheet material from the film cassette and the kit's housing, respectively, and orientate them in superposition;

rupturing means mounted for movement into the kit's housing and into engagement with the container of processing liquid when the kit is at said positioning means, and said loading door is closed, so as to rupture the container and thereby enable the processing liquid to flow to the processing liquid dispenser and thence onto the sheet material prior to it being superposed with the film;

means movable from a first position to a second position for opening the housing of the kit; and

manually operable means drivingly coupled to said rupturing means and said movable means in a manner which insures that said movable means opens the kit's housing prior to said rupturing means being moved into the kit's housing.

---

**4,370,046**

**METHOD AND APPARATUS FOR PROCESSING EXPOSED PHOTOGRAPHIC MATERIAL WITH BATH CONSTITUENT SUPPLY OUTLET OPENINGS AT DIFFERENT LEVELS**

**Leo Van Bouwel, Mortsel, Belgium; Erwin Geyken, Neubiberg, Fed. Rep. of Germany; Franz Ertl, Munich, Fed. Rep. of Germany, and Adolf Fleck, Unterhaching, Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jul. 28, 1981, Ser. No. 287,570**

**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028675**

**Int. Cl.³ G03D *3/06***

**U.S. Cl. 354—324** **24 Claims**

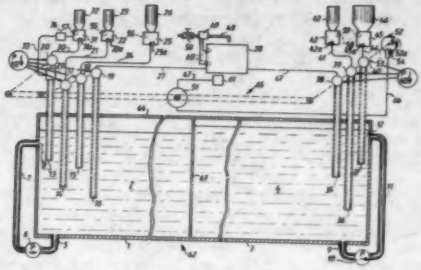
1. Apparatus for processing material, particularly exposed photosensitive material, comprising:

(a) container means accommodating a processing bath;

(b) a plurality of sources of different constituents of said bath;

(c) supply means for supplying said constituents to said bath, said supply means including supply conduits which

project into said bath and respectively communicate with said sources, said supply conduits having respective outlet openings at different levels below the surface of said bath; and



(d) a bath circulation conduit communicating with said container means, said circulation conduit having an inlet end which is located in the region of said outlet openings.

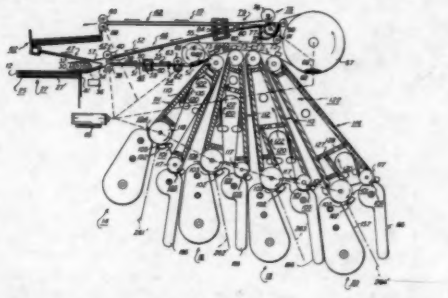
---

4,370,047

## HIGH SPEED COLOR APPARATUS

David E. Damouth; George R. Mott, both of Rochester, and Klaus K. Stange, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1978, Ser. No. 892,810
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—3 BE 3 Claims



1. A high speed apparatus for reproducing copies of full color originals on copy substrate material from multiple color component images of said originals by means of controlled recording beams, each of said recording beams being associated with an individual one of said color component images, the combination comprising:

(a) means forming a path for said copy substrate material;

(b) a generally triangular photoconductive belt module associated with each of said recording beams, each of said belt modules including an endless photoconductive belt with means for supporting said belt for operative movement in an endless path,

said belt modules being positioned in closely spaced side-by-side relationship with one apex of each of said belt modules in operative disposition with said copy substrate path at minimally spaced intervals therealong,

(c) means for developing the color component images formed on said belts, said developing means including a developing device associated with each of said belts at a developing station; and

(d) means forming a transfer point along each of said belts at said one apex whereat color component images developed on said belts are successively transferred to said copy substrate material in registered superimposition to form full color copies of said originals,

(e) means for directing said recording beams onto said belts at an imaging station,

said imaging and developing stations being disposed opposite second and third apices of said belt module respectively to thereby facilitate disposition of said belt modules in close side-by-side relationship,

said belt supporting means forming a belt run for said photoconductive belt, the length of said belt in each of said belt modules being substantially the same and greater than said belt run,

said belt supporting means including a vacuum chamber interior of said belt module, said vacuum chamber opening toward said belt whereby on evacuation of said chamber, a portion of said belt is drawn into said chamber to tension said belt.

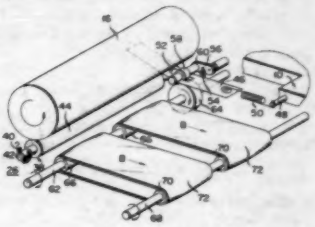
---

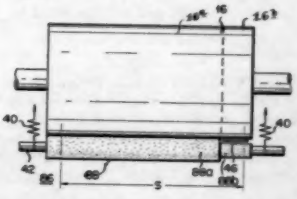
4,370,048

## ELECTROSTATIC COPYING APPARATUS

Kunihiro Shibuya, Yokohama; Koichi Uchida, Sagamihara, and Shinichi Hashimoto, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 11, 1981, Ser. No. 233,433
Claims priority, application Japan, Feb. 14, 1980, 55-17088
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR 3 Claims





1. An apparatus for transferring a developed image to a sheet of paper comprising:

a photosensitive drum having first and second portions, said drum including a photosensitive layer which is laid on the outer periphery of at least the first drum portion;

a transfer roller including a surface portion formed of an elastic material and disposed in contact with the first and not the second drum portions, said transfer roller cooperating with the photosensitive layer to clamp the sheet of paper to transfer the developed image onto the sheet of paper; and

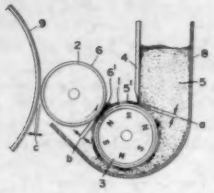
a tape provided apart from said transfer roller and in slidable contact with the outer periphery of the second drum portion for peeling the sheet of paper from the photosensitive drum after the image developed has been transferred to the sheet.

4,370,049

## IMAGE DEVELOPING DEVICE

Tsukasa Kuge; Koichi Tanigawa, and Hiroyuki Adachi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,837
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 DD 15 Claims



1. A developing device for developing a latent image on a latent image bearing member, comprising:

an image-developing bearing member for supporting one-component magnetic developer thereon;

means for displacing said image-developing bearing member for transporting a layer of said developer to a developing position;

a developer-feeding bearing member positioned in the proximity of said image-developing bearing member;

magnetic-field generating means positioned opposite to said image-developing bearing member across said developer-feeding bearing member;

a magnetic pole positioned on said magnetic-field generating means in facing relationship to said image-developing bearing member for forming a magnetic brush on said developer-feeding bearing member in such a manner that said magnetic brush comes into contact with said image-developing bearing member to form a thin developer layer thereon;

a magnet positioned inside said image-developing bearing member in facing relationship to said magnetic pole for forming magnetic brush;

wherein the magnetic transporting force of said image-developing bearing member is selected smaller than that of the developer-feeding bearing member in the mutually facing area between said bearing members.

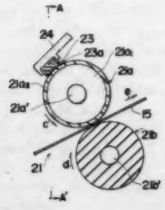
---

4,370,050

## IMAGE TRANSFER TYPE COPYING APPARATUS WITH PRE-TRANSFER CLEANING OF TRANSFER PAPER

Toshio Matsui, and Masaru Komura, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 6, 1981, Ser. No. 251,609
Claims priority, application Japan, Apr. 29, 1980, 55-59498[U]
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 SH 11 Claims



1. An image transfer type copying apparatus comprising a pair of confronting transport rollers located in the path of advance of a cut sheet of transfer paper from a paper feeding station to an image transfer station for advancing the cut sheet of transfer paper directly to the transfer station, and a member in pressing contact with the surface of at least one of the transport rollers for triboelectrically charging the surface of the roller whereby said roller cooperates in said advancing of said sheet and electrostatically removes dust particles from a surface thereof.

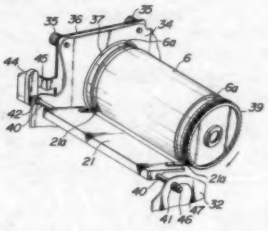
---

4,370,051

## ACTUATING MEANS FOR SEPARATOR PAWL

Takashi Matsuyama, Hachioji, and Hideyuki Kawaza, Tokyo, both of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 297,012
Claims priority, application Japan, Aug. 28, 1980, 55/121110[U]
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 R 5 Claims



1. An actuating apparatus for a separator pawl of an electrophotographic device having a photosensitive drum to be mounted and dismounted through an opening of a sidewall of said device, a lid detachably attached on said sidewall for closing said opening, and a separator pawl adapted to separate a recording sheet from tight contact with said photosensitive drum, said actuating apparatus comprising:

a holder holding said separator pawl which holding means is movable between a position for holding said separator pawl at an operating position thereof in the proximity of said photosensitive drum and another position for holding said separator pawl at a retarded position thereof away from said photosensitive drum;

a bias means urging said separator pawl toward said retarded position thereof;

an actuating member secured to said holder; and

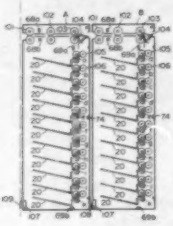
a stopping member integrally secured to said lid so as to be engageable with said actuating member in such a manner that, when said lid is attached on said sidewall in position, said stopping member comes into operative engagement with said actuating member and keeps said separator pawl at said operating position thereof, whereas, when said lid is detached from said sidewall, said stopping member disengages from said actuating member and allows said bias means to move said separator pawl toward said retarded position thereof.

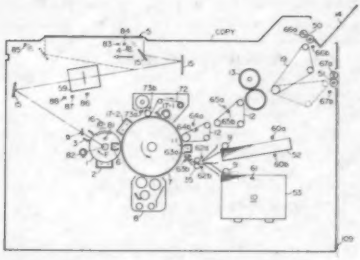
4,370,052

## COPYING APPARATUS WITH DETACHABLE SORTER

Katsumi Murakami, Kawasaki; Katsushi Furuichi, Yokohama, and Toshio Honma, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 138,983
Claims priority, application Japan, Apr. 19, 1980, 55-48407; Apr. 19, 1980, 55-48408
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R 28 Claims





1. A copying apparatus, comprising:
a detachable sorter having plural storage bins;
means for detecting the number of usable bins of said sorter;
means for generating a detection signal representative of said number of usable bins in said sorter; and
means for controlling the operation of said apparatus in response to the detection signal from said detecting means.

---

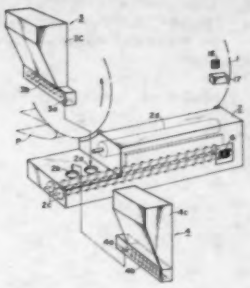
4,370,053

## DEVELOPER SUPPLY DEVICE

Kazuhiro Hirayama, Yokohama, and Michio Ito, Hachiohji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1981, Ser. No. 224,802
Claims priority, application Japan, Jan. 19, 1980, 55-4992
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D 10 Claims

1. A developer supply device for supplying a developer consisting of toner and carrier to a developing device for developing a latent image on a latent image bearing member, said supply device comprising:
toner supply means for supplying toner to said developing device;
means for detecting any variation in volume of the developer within the developing device and for generating a detect signal indicative thereof;
means for controlling the toner supply in accordance with the detection signal of said volume detecting means;
carrier supply means for supplying carrier to said developing device;
means for detecting the image density after development and for generating a detection signal indicative thereof; and



means for controlling the carrier supply means in accordance with the detection signal of said density detecting means.

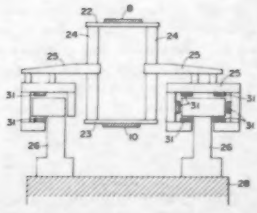
---

4,370,054

## PROJECTION EXPOSURE APPARATUS

Junji Isohata, Kawasaki, and Hironori Yamamoto, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,387
Claims priority, application Japan, Apr. 2, 1981, 56-50364; Apr. 7, 1981, 56-52211
Int. Cl.³ G03B *27/42*
U.S. Cl. 355—53 6 Claims

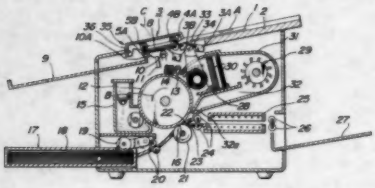


1. A projection exposure apparatus, comprising:
a mask support member for supporting a mask;
a wafer support member for supporting a wafer;
a projection optical system for projecting the image of said mask onto a part of said wafer;
guide means for displacing at least one of said mask and said wafer relative to said projection optical system in a plane perpendicular to the optical axis thereof, said guide means comprising first and second generally linear guide members and first and second guided members respectively engaging with said first and said second guide members; and
compensating means provided between said first and said second guide members for compensating for non-linearity of one of said guide members.

## 4,370,055
## DUPLICATING SYSTEM COMPRISING ELECTROPHOTOGRAPHIC COPYING APPARATUS AND OPTION DEVICE

**Masaji Nishikawa; Kiyoshi Miyashita, and Muneo Kasuga, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan**

**Filed May 7, 1981, Ser. No. 261,741**
**Claims priority, application Japan, May 9, 1980, 55-61299**
**Int. Cl.³ G03B** *27/70*
**U.S. Cl. 355—14 SH** **14 Claims**



1. A duplicating system comprising an electrophotographic copying apparatus which includes first optical scanning means for making a slit exposure, first means for feeding a first document to be copied at a first speed with respect to said first optical scanning means, photosensitive means for forming an electrostatic latent image corresponding to the image of document, means for forming a duplicated copy with the aid of said latent image, and sequence control means for controlling said various means in such a manner that said image of first document is projected onto the photosensitive means for an imaginary control start position, and an option device which includes means for detachably mounting the option device on the copying apparatus, second optical scanning means for making a slit exposure, second means for feeding a second document to be copied at a second speed with respect to said second optical scanning means and an optional optical means for projecting the image of second document onto said photosensitive means of the copying apparatus, wherein said second feeding means and second optical scanning means have a geometrical configuration similar to that of said first feeding means and first optical scanning means so that the image of the second document is projected on the photosensitive means from the same position as said imaginary control start position and the duplicating operation for the second document with the option device is commonly controlled by said sequence control means provided in the copying apparatus.

---

## 4,370,056
## DEVELOPMENT SYSTEM

**Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

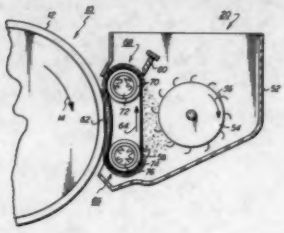
**Filed Feb. 5, 1981, Ser. No. 231,644**
**Int. Cl.³ G03G** *15/09*
**U.S. Cl. 355—3 DD** **12 Claims**

1. An apparatus for developing a latent image recorded on a rigid member, including:

a flexible belt;

a pair of opposed, spaced rollers generating a magnetic field with said belt movably supported thereon, said belt having at least a portion thereof positioned closely adjacent to the rigid member defining a development zone therebetween, for transporting developer material attracted thereto by said pair of rollers into contact with the rigid member in the development zone so as to develop the latent image recorded thereon; and

means for maintaining said belt at a pre-selected tension of sufficient magnitude to compress the developer material



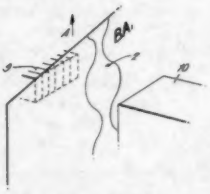
being transported into contact with the rigid member and to space said belt therefrom.

---

## 4,370,057
## METHOD OF VERIFICATION OF A SHEET ELEMENT, SUCH AS A BANKNOTE

**Peter D. Lee, Hertford, England, assignor to The Governor and Company of the Bank of England, London, England**

**Division of Ser. No. 881,502, Feb. 27, 1978, Pat. No. 4,290,630.**
**This application May 22, 1980, Ser. No. 152,498**
**Claims priority, application United Kingdom, Mar. 1, 1977, 8628/77**
**Int. Cl.³ G01N** *21/00*; **B42D** *15/00*
**U.S. Cl. 356—71** **5 Claims**



1. A method of verification of a sheet element, such as a banknote, comprising providing the sheet element with an incorporated authenticating device comprising a film having at least one edge which is provided with a non-rectilinear portion or portions which are shaped to provide coded information relating to the sheet element, and sensing the shape and proportions of said at least one edge of said shaped non-rectilinear portion or portions of said film to generate a signal dependent upon the shape and proportions of the edge of the film so as to derive said coded information.

---

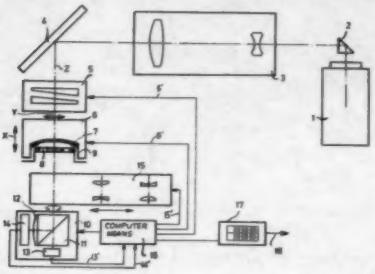
## 4,370,058
## DIGITAL FOCIMETER AND METHOD

**Otto Trötscher; Horst Stacklies, both of Aalen, and Meinrad Mächler, Ellwangen, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany**

**Filed Jul. 29, 1980, Ser. No. 173,377**
**Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934263**
**Int. Cl.³ G01B** *9/00*
**U.S. Cl. 356—125** **13 Claims**

1. A method for automatic digital measurement of vertex dioptric powers in the principal planes of toric spectacle lenses, wherein the spectacle lens (7) to be measured is transilluminated by a parallel-ray bundle of monochromatic light, wherein the light bundle which passes through the spectacle lens is limited by a stop (8) in the immediate vicinity of the spectacle lens vertex and is directed onto at least one self-scanning diode line (13, 14), wherein signals produced by the diode

line (13, 14) are used to obtain a digital measurement value, and wherein the light which passes through the spectacle lens and the stop is divided by a beam splitter (11) into two individual



light beams such that each of the resulting two individual light beams falls onto a different one of two diode lines (13, 14), which diode lines together form a coordinate system.

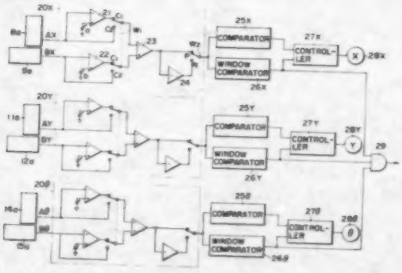
---

**4,370,059**

## METHOD AND MACHINE FOR POSITIONING AN OBJECT PHOTOELECTRICALLY USING A REGISTER MARK

**Tatsunosuke Masuda, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan**

**Filed Aug. 21, 1979, Ser. No. 68,410**
**Claims priority, application Japan, Aug. 30, 1978, 53-106533**
**Int. Cl.³ G01B *11/00***
**U.S. Cl. 356—400** **9 Claims**




1. A method for positioning an object which has a register mark on it, one of the object and the register mark being transculent while the other being opaque, wherein:

light is shone onto a pair of asymmetrically disposed photoelectric detectors, and then the object is moved in between the light and the detectors, and advanced in a direction,

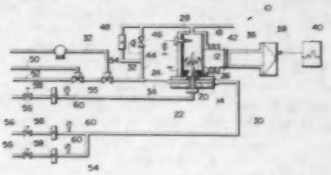
and, when the ratio between the amounts of the register mark which cover each of the detectors, which is measured by measuring the outputs of the detectors, reaches a certain predetermined value, this advancement is stopped.

**4,370,060**

## FLAME PHOTOMETRIC DETECTOR ANALYZER

**Isao Murase; Katsutoshi Hirose, both of Yokosuka, and Shoji Yoneya, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Dec. 10, 1980, Ser. No. 215,198**
**Int. Cl.³ G01N *21/72***
**U.S. Cl. 356—417** **21 Claims**



1. A flame photometric detector analyzer, comprising:

a first conduit means through which a fuel gas flows;

a fuel gas nozzle connected to said first conduit means to be supplied with the fuel gas to form a flame at the tip thereof;

a second conduit means through which a combustion supporting gas is supplied to the vicinity of the tip of said fuel gas nozzle to assist the combustion of the fuel gas discharged from said nozzle;

a third conduit means through which a sample gas having a measuring object component is supplied to the flame;

means for controlling the concentration of oxygen contained in said combustion supporting gas to be supplied to the flame within a range of 11.5 to 16%; and

a photodetector means responsive to photoemission from the measuring object component of the sample gas introduced into the flame.

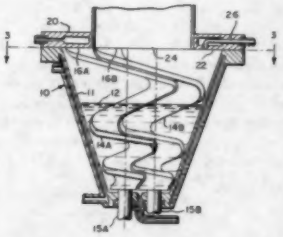
---

**4,370,061**

## APPARATUS FOR FINISHING SYNTHETIC POLYMERS

**Richard D. Livingston, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jul. 13, 1981, Ser. No. 283,112**
**Int. Cl.³ B29B *1/10***
**U.S. Cl. 366—85** **3 Claims**




1. In an apparatus for finishing synthetic polymers including an enclosed vessel having an interior surface throughout its length in the shape of two intersecting conical frustums with axes parallel and substantially vertical, the base of the frustums being displaced upward with respect to the apexes, two driven interengaging helical screw elements rotatably supported on shafts passing through seals in the base of the vessel, the screw elements when co-rotated conforming to the interior surface of the vessel such that the screw elements effect a complete wiping of the interior surface, and wherein the screw elements interengage uninterruptedly along their lengths such that each element effects a complete wiping of the adjacent element and

wherein the vessel has a top plate with a vent opening therethrough, said top plate having a flat inner surface and the screw elements having substantially flat upper surfaces which when co-rotated conform to said top inner surface such that the upper surface of the screw elements effect a complete cleaning of said top inner surface, the improvement comprising: said vent opening being of greater radial extent than the paths swept by the upper surfaces of the co-rotating screw elements to permit continuous overlap of the edge of the opening by the upper surface of the co-rotating screw elements.

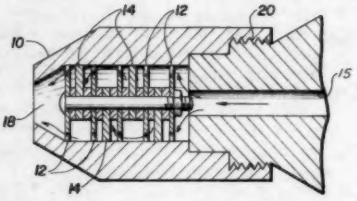
---

**4,370,062**

## DISPENSING GUN FOR TWO-PART ADHESIVES

**Warren E. Moody, 95 Fiesta Way, Fort Lauderdale, Fla. 33301**

**Filed Feb. 19, 1980, Ser. No. 122,081**
**Int. Cl.³ B01F 5/20**
**U.S. Cl. 366—130** **2 Claims**




1. A gun-type dispensing gun for mixing two separate components of material which comprises:

a gun body including a handle end and a nozzle end;

two separate feed channels in said body connected at said handle end for feeding different materials to be dispensed;

a separate control valve for controlling material flow through each of said feed channels;

two separate discharge channels extending from said control valves to said nozzle end of said body;

a single manually operable handle means for simultneously operating said valves to permit material flow from said separate feed channels to said separate discharge channels;

a mixing chamber removably secured to said nozzle end of said body;

a plurality of separate mixing baffle elements assembled within said mixing chamber, said mixing baffle elements comprise alternating perforated and clipped-edge solid washers separated by suitable spacers with all of said mixing baffle elements secured together by suitable means and the clipped-edge washers being oriented to provide a zig-zag path for the material passing through the assemblage; whereby said plurality of baffle elements are contained within said mixing chamber and removable simultaneously with said mixing chamber.

---

**4,370,063**

## CLOCK WITH DUAL TIME-INDICATORS

**Joseph Lee, 43 S. Russell St., Boston, Mass. 02114**

**Filed Jan. 19, 1981, Ser. No. 226,422**
**Int. Cl.³ G04B 25/00, 19/00**
**U.S. Cl. 368—71** **10 Claims**

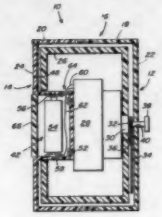
1. A clock with dual time-indicators, said clock comprising:

(a) a casing;

(b) a drum rotatably mounted within said casing;

(c) a motor mounted to said casing, said motor having first and second shafts, said first shaft rotating at a rate of one revolution per a multiple of a twelve hour period and said second shaft rotating at a rate of one revolution per hour, said drum mounted coaxially to and rotating with said first shaft;

(d) first time-indicating means at one end of said casing; and



(e) second time-indicating means at an opposite end of said casing.

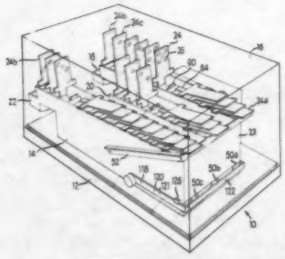
---

**4,370,064**

## COUNTING DEVICE WITH BALL ACTUATED ALIGNED ROTATABLE INDICATING ELEMENTS

**Alan A. Hicks, Chicago; Howard J. Morrison, Deerfield; John R. Wildman, North Riverside, and Terry E. Webb, West Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Filed Oct. 6, 1980, Ser. No. 193,934**
**Int. Cl.³ G04F 1/04**
**U.S. Cl. 368—93** **30 Claims**



1. A counting device comprising:

a ball;

a housing including an inclined track for said ball;

a plurality of indicating elements aligned with said track mounted for rotation against the next adjacent element in said line;

actuating means operatively connected to said indicating elements for rotating said elements when said actuating means is contacted by said ball as it rolls along said track; and

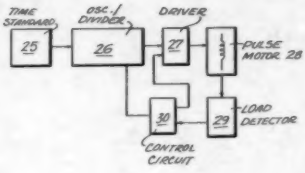
means for returning said ball to the upper end of said track.

**4,370,065**

## STEP MOTOR CONTROL MECHANISM FOR ELECTRONIC TIMEPIECE

**Yoshikazu Kawamura; Minoru Hosokawa; Sakiho Okazaki, and Hiroshi Ishii, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Continuation of Ser. No. 839,867, Oct. 6, 1977, Pat. No. 4,212,156. This application Mar. 24, 1980, Ser. No. 133,046**
**Claims priority, application Japan, Oct. 6, 1976, 51-120146**
**The portion of the term of this patent subsequent to Jul. 15, 1997, has been disclaimed.**
**Int. Cl.³ G04F *5/00*; G04C *3/00***
**U.S. Cl. 368—157** **6 Claims**




**1.** An electronic timepiece having a step motor and comprising a quartz crystal vibrator producing a high frequency time standard signal, divider circuit means for producing low frequency time signals in response to said high frequency time standard signal; a gear train driven by said step motor and adapted to place the step motor in one of a first normally loaded condition and second heavily loaded condition; said step motor including drive coil means; load detection means for detecting the current induced in the drive coil means and in response thereto for producing a load detection signal when said step motor is in a second loaded condition; driving and control means intermediate said divider circuit means and said step motor for receiving the low frequency signal from the divider circuit means, said driving and control means being adapted to apply a first signal having a first pulse width during a predetermined unit of time defining the period of the first drive signal to said drive coil means of said step motor in response to said low frequency signal, said driving and control means in response to said load detection signal being applied thereto, being adapted to apply to said drive coil means a second drive signal having a second pulse width of longer duration than said first pulse width of said first drive signal and of the same polarity as said first drive signal having said first pulse width, the first pulse of said second drive signal being applied during said predetermined unit of time.

---

**4,370,066**

## CORRECTION SIGNAL INPUT SYSTEM FOR ELECTRONIC TIMEPIECE

**Sizuo Yamaguchi, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan**

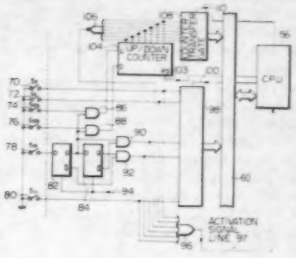
**Filed Oct. 29, 1980, Ser. No. 201,848**
**Claims priority, application Japan, Nov. 9, 1979, 54-145088**
**Int. Cl.³ G04C *9/00***
**U.S. Cl. 368—188** **2 Claims**

**1.** In an electronic timepiece having a crown and switch means coupled thereto and responsive to rotation of said crown for producing correction data comprising a train of correction pulses, a source of a unit time signal, a central processing unit coupled to receive said unit time signal with said central processing unit being normally in a state of non-activation and being periodically activated to perform time data processing in response to said unit time signal, and display means for displaying time data produced by said central processing unit, a correction signal input system for supplying said correction data from said crown-coupled switch means to said central processing unit, comprising:

counter circuit means coupled to receive said correction pulses, to count and temporarily store said correction data;

zero detection circuit means coupled to said counter circuit means for detecting a condition wherein the contents of said counter circuit means are other than zero, and for producing an output indicative of the occurrence of said condition; and

transfer gate circuit means coupled between output terminals of said counter circuit means and said central processing unit;




said central processing unit being responsive to said output signal from said zero detection circuit means for being set into a state of activation and for generating a transfer enable signal when said state of activation has been attained, said transfer gate circuit means being responsive to said transfer enable signal for transferring the contents of said counter circuit means to said central processing unit to be processed thereby, said central processing unit further generating a counter reset signal after said transfer of said counter contents has been performed, said counter circuit means being responsive to said counter reset signal for being reset to a count of zero.

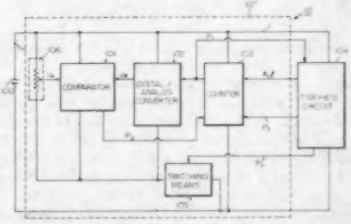
---

**4,370,067**

## ELECTRONIC TIMEPIECE WITH GAIN/LOSS ADJUSTMENT

**Ryoji Iwakura; Tatsuo Nitta, and Kazutoshi Takahashi, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan**

**Continuation-in-part of Ser. No. 913,917, Jun. 7, 1978, abandoned. This application May 6, 1980, Ser. No. 147,006**
**Claims priority, application Japan, Apr. 11, 1978, 53/42383**
**Int. Cl.³ G04B *17/20*; G04C *17/00*; G04B *23/02***
**U.S. Cl. 368—202** **10 Claims**




**1.** An electronic timepiece comprising:

a timepiece circuit including means for generating clock pulses and means for controlling the operational state of the timepiece; and

a control circuit connected to the timepiece circuit for controlling said operational state and including a counter responsive to said clock pulses to provide a digital output

signal, a digital/analog converter converting said digital output signal into an analog output signal, a potentiometer adapted to provide an analog input signal, a comparator for comparing said analog output signal and said analog input signal and producing an output signal when said analog output signal and said analog input signal coincide with one another, said control circuit being responsive to said output signal from said comparator to stop the operation thereof whereafter said digital output signal is applied to said operational controlling means as a control signal by which the operational state of said timepiece circuit is controlled and said control circuit further includes switching means for controlling the operation of each of said potentiometer, said digital/analog converter and said comparator;

wherein said control signal comprises a plurality of digital output signals, and said timepiece circuit generates a plurality of clock signals;

a pulse width modulation circuit including coincidence detection circuit for detecting a coincidence between said plurality of digital output signals and said plurality of clock signals to generate a coincidence signal; and

means for generating a pulse width modulated signal in response to said coincidence signal.

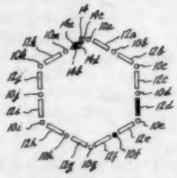
---

**4,370,068**

## HOUR AND MINUTE DISPLAY FOR A CHRONOMETER

**Jeong S. Han, 189-42 Bukahyun-Dong, Seodaimun-ku, Seoul, Rep. of Korea**

**Filed Aug. 15, 1980, Ser. No. 178,616**
**Int. Cl.³ G04C *17/02***
**U.S. Cl. 368—240** **12 Claims**



1. An hour and minute display for the face of a chronometer, said chronometer face including a perimeter portion and a central portion, said hour and minute display comprising:

a plurality of first display means selectively actuatable to indicate a desired hour, said first display means being arranged in spaced relation to one another along the perimeter of a first closed geometric figure, said perimeter of said first closed geometric figure lying within the perimeter portion of said chronometer face, said first display means surrounding said central portion of said chronometer face;

a plurality of second display means selectively actuatable to indicate five-minute increments past the hour, the number of second display means being one less than the number of first display means, said second display means being arranged in spaced relation to one another about the perimeter of a second closed geometric figure in cooperative relation to said first display means, said perimeter of said second closed geometric figure lying within said perimeter portion of said chronometer face and said second display means surrounding said central portion of said chronometer face; and

third display means selectively actuatable to indicate time increments of one, two, three, or four minutes, said second and third display means cooperably actuatable to indicate time increments from one to 59 minutes, said third display means being arranged along the perimeter of said second closed geometric figure, said third display means occupying substantially the same amount of space as one of said second display means, said first, second and third display means lying within the perimeter portion of said chronometer face so as to leave the central portion of said chronometer face free of any hour or minute displays.

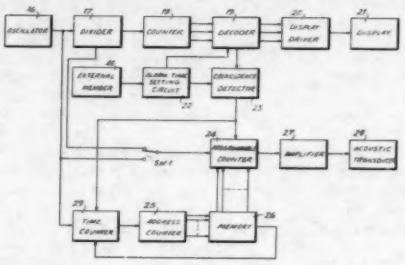
---

**4,370,069**

## ELECTRONIC ALARM TIMEPIECE

**Hiroaki Nomura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 927,308, Jul. 24, 1978, abandoned. This application Jul. 25, 1980, Ser. No. 172,116**
**Claims priority, application Japan, Jul. 22, 1977, 52-88093; Jul. 22, 1977, 52-88094**
**Int. Cl.³ G04B *21/00*; G10H *1/02***
**U.S. Cl. 368—273** **13 Claims**




1. In an electronic timepiece having oscillator means for generating a standard high frequency signal for timekeeping, a divider circuit receiving and dividing down said standard high frequency signal into lower frequency timekeeping signals, counter means for accumulating said lower frequency timekeeping signals in categories representative of time, said categories including at least hours and minutes, display means for visual presentation of timekeeping data, and means for driving said display, said counter means inputting time data signals to said means for driving, the improvement therein comprising:

a note producing circuit, said note producing circuit including a memory circuit for storing note and time duration data, at least one programmable counter means for automatically variably dividing pulses outputted by said oscillator means to produce in sequence difference notes of determined frequency in response to said data in said memory circuit;

circuit means for controlling the duration of each note, said circuit means for controlling duration including a time counter dividing down said standard signals from said oscillator means, the division ratio of said time counter being automatically variable in response to said time duration data stored in said memory;

an address counter receiving the output of said time counter and outputting a signal to said memory, said time counter output signal advancing the memory address, data for the next succesive note being input from said memory circuit to said programmable counter means;

an electro-acoustic transducer receiving the output of said note producing circuit and audibly outputting said sequence of notes to produce a special sound effect;

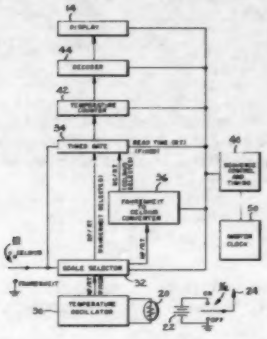
means to actuate said note producing circuit;

switch means for selectively connecting said first programmable counter means to said oscillator means directly or to a stage in said divider circuit, either of two frequencies being selectively inputted to said programmable counter means by operation of said switch means, said notes being produced in response to said data stored in said memory in two octave ranges.

## 4,370,070
## DIGITAL THERMOMETER HAVING FAHRENHEIT AND CELSIUS READOUT MODES

Marcel H. Leroux, Trumbull, Conn., assignor to General Electric Company, New York, N.Y.

Filed Feb. 13, 1981, Ser. No. 234,372
Int. Cl.³ G01K 7/22
U.S. Cl. 374—170 5 Claims



1. An electronic digital thermometer comprising:

temperature responsive means for producing pulses at a frequency related in a known manner to the sensed temperature,

primary counting means, control means coupled to temperature responsive means and said primary counting means for permitting the transmission of pulses produced by said temperature responsive means to said primary counting means for a fixed period of time only, said control means comprising means for permitting the transmission to said primary counting means of a selected one only of at least two predetermined portions of the pulses produced by said temperature responsive means during said fixed period of time, said selected portions of pulses being proportional to the magnitudes of the sensed temperature as expressed in the Fahrenheit and Celsius measurement scales,

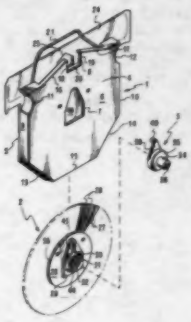
the fixed period of time established by said control means and the operating frequency of said temperature responsive means relative to sensed temperature being selected such that the total number of pulses produced during said fixed period of time is a multiple N of the temperature as expressed in the Fahrenheit scale, said control means permitting the transmission of all of said pulses when the Fahrenheit scale is the selected scale and said control means further comprising conversion means operative when the selected scale is the Celsius scale to prevent the transmission to said primary counting means of the first 32 N pulses produced by said temperature responsive means during said fixed period of time and thereafter for the remainder of said fixed period of time to permit the transmission to said primary counting means of only five-ninths of the pulses produced by said temperature responsive means, whereby the total number of pulses transmitted to said primary counting means when the selected scale is the Celsius scale is the same multiple N of the temperature as expressed in the Celsius scale,

and decoding and display means coupled to said primary counting means for converting the number of pulses counted by said primary counting means during said fixed period of time into a digital display of the sensed temperature in the selected scale.

## 4,370,071
## PRINT PACKAGE

Adolph B. Habich, and Ronald E. Hunt, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 968,320, Dec. 11, 1978, abandoned. This application Dec. 12, 1980, Ser. No. 215,603
The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.
Int. Cl.³ B41J 1/30
U.S. Cl. 400—144.2 39 Claims



32. A daisy wheel printer print package comprising in combination:

(a) a daisy wheel print element rotationally positionable for printing use and non-use and including means for facilitating orientation of said element; and

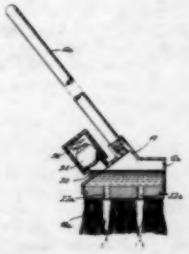
(b) a cartridge for housing said print element, said cartridge including means for facilitating orientation of said element, both said orientation means of said element and said cartridge being engageable with one another and structured to permit latching of said print element in only one rotational position upon engagement thereof during printing non-use.

---

## 4,370,072
## UTILITY BRUSH

Merritt L. Moffitt, Jr., 9 Weirwood Rd., Radnor, Pa. 19087

Continuation of Ser. No. 62,320, Jul. 30, 1979, abandoned. This application Apr. 10, 1981, Ser. No. 252,761
Int. Cl.³ A46B 11/04; B65B 1/06
U.S. Cl. 401—276 10 Claims



1. A utility brush comprising:

a brush head;

means for cleaning extending from one side of said brush head;

port means for communicating through said brush head from said cleaning means side to the other side thereof;

reservoir means for containing a liquid, said reservoir means

being connected to said port means at said brush head other side and having an opening in the top thereof; and

check valve means, associated with said reservoir means at said top opening, being biased to the closed position for maintaining a reduced pressure in said reservoir means when said reservoir means is subjected to emptying through said port means connection, said check valve means closing force being less than the pressure upon it created by the liquid head on said reservoir means when submerged for filling under atmospheric pressure and for venting said reservoir means when said reservoir means is subjected to filling from below through said brush head port means connection.

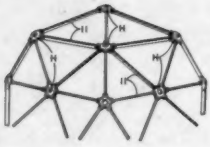
---

**4,370,073**

## CONNECTOR HUB FOR GEODESIC DOME STRUCTURES

**Dale A. Ohme, 3337 - 31st Ave. S., Minneapolis, Minn. 55406**

**Filed Sep. 23, 1980, Ser. No. 190,021**
**Int. Cl.³ F16D *1/00, 3/00*; F16L *41/00***
**U.S. Cl. 403—172** **1 Claim**



1. A connector hub for geodesic dome frame members comprising,

a central hub element with a plurality of pairs of spaced apart flange elements, each pair defining a stringer receiving slot for receiving the end portion of a stringer frame member,

means for connecting the stringer frame members received in said slots, to the respective pair of flange elements,

a plurality of stiffening web elements disposed between adjacent slots and connected with adjacent flange elements to form an extremely strong and rigid connector hub unit,

said flange elements being constructed and arranged to permit slight flexing movement under clamping pressure,

said stiffening webs terminating at intermediate portions of the length of said flange elements so that the outer end portions of said flange elements are free to flex slightly under clamping pressure, said connecting means including,

at least one clamping bolt extending through said pair of flange elements and through a stringer received in the slot between each pair of flanges, and

said clamping bolt being positioned in said outer end portions of said flanges to produce said clamping action against said stringer.

---

**4,370,074**

## FAN ASSEMBLY FOR VEHICLES

**Hiroto Masai, Toyota City, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan**

**Filed Oct. 24, 1980, Ser. No. 200,547**
**Claims priority, application Japan, Oct. 26, 1979, 54-149213[U]**
**Int. Cl.³ B25G *3/36*; E04G *7/00***
**U.S. Cl. 403—388** **5 Claims**

1. In a fan assembly of the type including a circular boss portion constructed of plastic and integrally formed with inwardly extending stress-distributor means, a connecting means for operatively connecting said boss portion to rotatable drive means, said connecting means including a plate spring fixedly attached to said stress-distributor means by bushing means; the improvement which comprises socket means including at least one socket formed in one of said stress-distributor means and

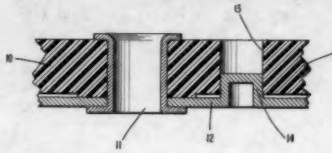


plate spring, and protrusion means including at least one protrusion on the other of said stress-distrubutor means and plate spring and fixedly received in said socket means for the purpose of absorbing vibration.

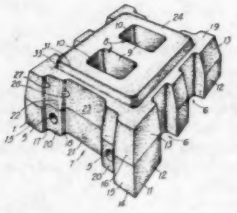
---

**4,370,075**

## REVETMENT GRIDS AND MATS

**John M. Scales, Norcross, Ga., assignor to Nicolon Corporation, Atlanta, Ga.**

**Filed Oct. 28, 1980, Ser. No. 201,569**
**Int. Cl.³ F02B *3/12***
**U.S. Cl. 405—20** **14 Claims**



1. A block for use as revetment, comprising a rectangular precast grid, said grid having:

(a) two opposed longer sides, each of said longer sides having:

(i) a lower vertical surface;

(ii) an upper sloping surface which slopes inward from the longer side lower vertical surface; and

(iii) at least one vertical channel;

(b) two opposed shorter sides, each of said shorter sides having:

(i) a lower vertical surface;

(ii) an upper sloping surface which slopes inward from the shorter side lower vertical surface; and

(iii) a vertical channel of depth approximately equivalent to the difference in length between the longer and shorter sides and width sufficient to receive projecting portions of the shorter sides of two like grids in staggered abutting relationship with said grid, said vertical channel having:

(x) two tiers;

(y) lower vertical first and second tier surfaces; and

(z) upper sloping first and second tier surfaces;

(c) a horizontal lower top surface extending around the periphery of the grid;

(d) a horizontal upper top surface raised slightly above the lower top surface; and

(e) a plurality of through tunnels extending horizontally parallel to the longer sides.

4,370,076

## TRANSPORTATION SYSTEMS AND ELECTRIC CABLES FOR USE THEREIN

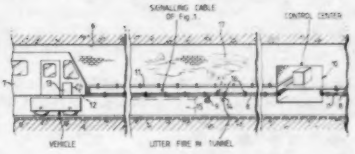
Thomas Sullivan, Manchester, and James E. Braddock, Wigan, both of England, assignors to Bicc Limited, London, England

Continuation-in-part of Ser. No. 3,049, Jan. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 884,270, Mar. 7, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,433

Claims priority, application United Kingdom, Mar. 10, 1977, 10268/77

Int. Cl.³ H01B 3/10

U.S. Cl. 405—132 4 Claims




1. A transportation system comprising at least one tunnel through which vehicles pass in operation and having electric cables extending longitudinally through said tunnel, characterised by the fact that at least one of said electric cables comprises a core comprising at least one polymer-insulated conductor, a bedding layer surrounding said core, an aromatic polyimide tape layer applied closely around said bedding layer, and a jacket applied closely around said tape layer, wherein

(a) both said bedding layer and said jacket are made of a halogen-free, silane-free composition having
an oxygen index of at least 32 and up to about 50;
a tensile strength of at least 2.5 and up to 10 $MN/m^2$;
an elongation at break which is at least 200 and up to 500%;
a permittivity of about 5.5–6.0;
a power factor of about 2–4%;
a volume resistivity in the region of $10^{11}$ ohm m;

and which, if burned, produces little visible smoke and no major amount of toxic or corrosive fumes and comprising by weight

20–35 parts of a rubbery ethylene-vinyl acetate copolymer comprising more than 28% and up to about 45% vinyl acetate;

optionally up to 10 parts of another halogen-free polymer;

52–75 parts of an alumina trihydrate with at least half its weight in particles with a diameter in the range 0.5–3.0 micrometer;

up to 3 parts of a lubricant selected from those fatty acids and salts thereof which are compatible with the composition; and

at least one antioxidant and at least one curing agent in effective amounts not exceeding 4 parts in all; and

said aromatic tape layer comprises at least two superposed tapes.

---

4,370,077

## METHOD OF PRESSURIZING AND STABILIZING ROCK BY PERIODIC AND REPEATED INJECTIONS OF A SETTABLE FLUID OF FINITE GEL STRENGTH

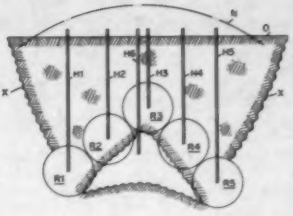
Stirling A. Colgate, 4616 Ridgeway, Los Alamos, N. Mex. 87544

Filed Aug. 4, 1980, Ser. No. 175,047

Int. Cl.³ E21D 19/00

U.S. Cl. 405—258 11 Claims

1. In a method of increasing the stress in a body of consolidated material by repeatedly fracturing the material with a settable gel, the improvement wherein for a selected increase to be created in the stress in the material by each fracture a gel is selected which has a gel strength about equal to the square of the selected stress increase divided by the bulk modulus of the material and wherein the period between fractures is sufficient




for the gel strength of the settable gel to increase by about an order of magnitude.

---

4,370,078

## PROCESS FOR CONSOLIDATING GEOLOGICAL FORMATIONS

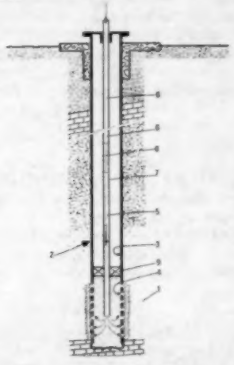
Claude Gadelle, Rueil Malmaison; Jacques Burger, Bougival, and Charles Bardon, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jan. 28, 1981, Ser. No. 229,221

Claims priority, application France, Jan. 28, 1980, 80 01825

Int. Cl.³ E02D 3/12

U.S. Cl. 405—264 9 Claims



1. A process for consolidating a geological formation, which comprises the steps of:

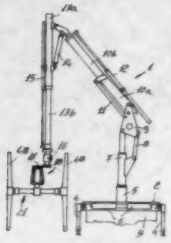
(a) injecting into the formation a liquid organic mixture comprising a polymerizable polyethylenic hydrocarbon, and a catalyst comprising a first component which is at least one zirconium, cerium, lanthanum or lanthanide salt and a second component which is at least one vanadium, manganese, cobalt or zinc salt, said mixture being capable of reacting in situ with an oxidizing gas, at the normal temperature of the formation, to produce a solid compound which consolidates the formation; and

(b) an amount of an oxidizing gas sufficient to produce substantially complete solidification of the polymerizable polyethylenic hydrocarbon and thereby consolidate the formation, without increasing the temperature in the formation above a preselected value and without substantial reduction in its permeability.

## 4,370,079
## APPARATUS FOR ENCASING EXCAVATIONS

Cesare Pizzirani, Via dei Giardini, 13 - Bologna, Italy

Filed Sep. 29, 1980, Ser. No. 191,966
Claims priority, application Italy, Oct. 12, 1979, 3507 A/79
Int. Cl.³ E02D 17/04
U.S. Cl. 405—272 6 Claims



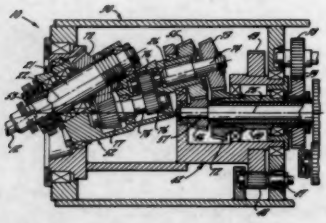
1. An apparatus for encasing excavations, comprising a movable crane equipped with a boom, and extendible struts adapted for rigging on the job site and for handling by said crane boom, characterized in that each strut comprises a tubular main body in the shape of an inverted "T" and defining a gripping collar at the leg of said "T", a pair of elements mounted for sliding to and fro each other along the bar of said "T", the sliding movement of said elements being controlled through a nut-and-screw drive, said elements terminating at the outer ends thereof in plate-like frames for propping the excavation walls, and a driveshaft driving said nut-and-screw drive through a bevel gear pair, said driveshaft being journaled at said leg of said "T" and projecting above it with a clutch member, said crane boom being terminated at the bottom end thereof with an actuator assembly intended to overlie said leg and being provided with clamping jaws for said collar as well as a reversible motor carrying a mating clutch member for engagement with said clutch member and entraining said driveshaft.

---

## 4,370,080
## TOOL HEAD HAVING NUTATING SPINDLE

Keith F. Goode, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Oct. 1, 1980, Ser. No. 192,687
Int. Cl.³ B23C 1/12
U.S. Cl. 409—200 8 Claims



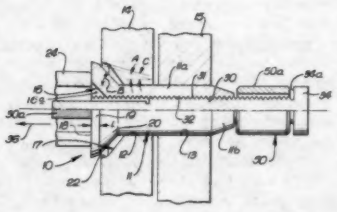
1. A machine tool head comprising a support, a power-driven shaft mounted on said support to rotate about its own axis, a first rotary slide mounted on said support to rotate relative to said support and said shaft about a first axis coinciding with the axis of said shaft, a second rotary slide supported by said first slide to rotate with said first slide about said first axis and to rotate relative to said first slide about a second axis which is inclined relative to said first axis at a predetermined acute angle substantially less than a right angle, a spindle supported by said second slide to rotate with said second slide about said second axis and to rotate relative to said second slide about a third axis which is inclined relative to said second axis at an acute angle equal to said predetermined angle, said first, second and third axes all intersecting one another at a common point, means selectively operable to turn said first slide about said first axis, means selectively operable to turn said second slide about said second axis, and means coupling said shaft to said spindle and operable to maintain a rotative drive from said shaft to said spindle to turn said spindle about said third axis both when said first slide is turned about said first axis and when said second slide is turned about said second axis.

---

## 4,370,081
## BLIND FASTENER WITH WORK GRIPPING HEAD

Franklin S. Briles, 1301 Dolphin, Corona Del Mar, Calif. 92625

Continuation of Ser. No. 66,933, Aug. 16, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,173
Int. Cl.³ F16B 13/06, 39/22
U.S. Cl. 411—43 3 Claims



1. In a tubular fastener having an axially extending tubular shank receivable in a work bore and an annular head receivable in forcible engagement with the work material forming a counterbore, and in combination with said work, the improvement comprising

(a) the head having an annular end face, a first forwardly tapered section located forwardly of said end face to forcibly engage the work counterbore and a second forwardly tapered section located forwardly of the first section, the taper angularity of the second section substantially exceeding the taper angularity of the first section,

(b) a stem extending through the tubular shank and head and

(c) means responsive to retraction of the stem toward the head end of the fastener to expand at the opposite end of the fastener and axially retain the fastener in position with the head first section forcibly engaging the counterbore,

(d) said forcible engagement of the head first forwardly tapered section with the work counterbore acting to create radial compression exerted on the stem to prevent loosening of the stem relative to the head and shank,

(e) the head first section having sufficient forcible engagement with the counterbore as to develop friction acting to block rotation of the head in response to torque application to the stem during said stem retraction, there being interference between said first section and counterbore between 0.001 and 0.010 inches,

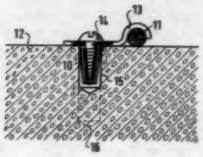
(f) the taper angularity of the first section being greater than 2° and less than 15°, and the axial length of the first section being within the range 0.140 inches to 0.010 inches, said selected length increasing within said length range as said selected angularity decreases within said angle range, the entirety of said axial length being radially outwardly spaced of and from a taper formed by the head and spaced outwardly of the stem.

4,370,082

## FASTENING ELEMENT

Börje E. I. Sundberg, Frejgatan 19, S-113 49 Stockholm, Sweden

Continuation of Ser. No. 82,166, Oct. 5, 1979, abandoned. This application Dec. 4, 1981, Ser. No. 327,481
Claims priority, application Sweden, Oct. 5, 1978, 7810425
Int. Cl.³ F16B 13/06
U.S. Cl. 411—61 3 Claims



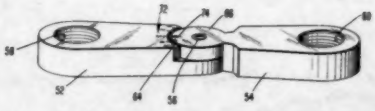
1. A fastening element for use with a tapered screw, comprising a longitudinally slotted conical sleeve of an at least slightly resilient sheet metal of uniform thickness, said sleeve having smooth interior and exterior tapered surfaces of linear circular cross-section, the slot being an arcuate portion of the circular cross-section of said sleeve and being of substantially constant width throughout its length, said slot further extending throughout the axial extent of said sleeve, the taper of said surfaces being uniform throughout their axial extent, and being complemental in relation to the outside diameter of the screw, whereby upon insertion of said sleeve into a hole and the screw into said sleeve, the friction against the internal hole surface effects a holding force which exceeds the torque that the screw causes as it is being driven into said sleeve, the conicity of the tapered sleeve being in the range of 14 to 16 degrees, namely the same conicity as the average conicity of the screw.

4,370,083

## MULTIPLE THREADED FASTENER ASSEMBLY

William R. Burnett, Palo Alto, and Charles T. Thompson, Cupertino, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 7, 1980, Ser. No. 176,171
Int. Cl.³ F16B 37/00, 39/28
U.S. Cl. 411—87 9 Claims



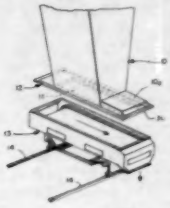
1. A multiple fastener assembly comprising two separate members, each said member having a threaded bore therein forming a nut for receiving a fastening means, hinge means interconnecting said members and providing for variable positioning of one said member with respect to the other angularly about the axis of said hinge means, to thereby adjust the relative spacing between the two said bores, and whereby said members are held by each other during the fastening operation, and said bores having their axes parallel to said axis of the hinge means.

4,370,084

## POWDER UNLOADING APPARATUS

Robert F. Weaver, Stevens Point, Wis., assignor to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Mar. 16, 1981, Ser. No. 244,007
Int. Cl.³ B65G 67/06
U.S. Cl. 414—292 4 Claims



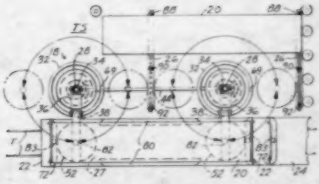
1. Apparatus for effecting discharge of a powder from a chamber containing the same, the chamber having a downwardly extending part at its lower end which provides a downwardly faced opening, a seal plate secured to the lower end of said part, the plate having an opening in free communication with the opening of the chamber part, said plate having a margin forming a downwardly faced sealing area, an assembly unit adapted to cooperate with the sealing plate, the unit comprising a closed housing having side and end walls surrounding an upperly faced opening and having upper margins forming an upwardly faced sealing area surrounding the opening of the housing and which is complimentary to the first named sealing area, an endless belt disposed within the housing, means for mounting the belt whereby its upper run extends in a plane parallel and contiguous to said upperly faced sealing area, pulleys within the housing adjacent the ends of the same about which the belt is looped, said belt being adapted to be driven whereby the upper run of the same traverses across the upwardly faced opening of the housing in a direction toward one discharge end of the housing, means at said discharge end of the housing forming a downwardly extending powder discharge passage, and means for elevating or lowering the assembly unit relative to said chamber, the unit when elevated having its sealing area pressed into sealing engagement with the sealing area of the seal plate.

4,370,085

## ROTARY PARALLEL ARM LOADER AND SYSTEM

Leonard D. Barry, 19300 Pennington, Detroit, Mich. 48221

Filed Aug. 15, 1979, Ser. No. 66,687
Int. Cl.³ B65G 67/22
U.S. Cl. 414—337 20 Claims



1. A loader for a load transfer system having a vehicle way, vehicle means thereon for traveling said way and having at least one berth for a load: said loader comprising a plurality of horizontally spaced pivot means each having a vertical axis equally spaced from said way, a plurality of arms each mounted to revolve on one of said pivot means, load pivot and support means having substantially vertical axes parallel to each other carried on the outer end of each of said arms at

equal distances from the axis of their respective said pivot means to be moveable with said arm to swing out centrally to substantially the centerline of said berth traveling with respect to said pivot means; a circular cam track substantially concentric about each of said pivot means and having at least one load lift slope; wheel means on each of said arms for running on its associated said cam track to support and lift the associated arm along a transfer arc of movement; means for coordinating said arms to turn substantially parallelly to one another, means for engaging said arms with the vehicle to rotate said arms to transfer a load, said arms being supported to extend over said vehicle way with said load pivot and support means being substantially centered transversely on the berth center line when fully extended over the vehicle.

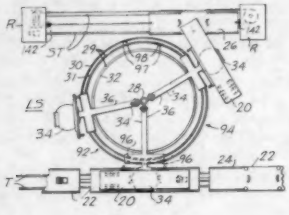
---

**4,370,086**

## ROTARY LOADER AND SIDE COUPLING SYSTEM

**Leonard D. Barry, 19300 Pennington, Detroit, Mich. 48221**

**Filed Aug. 15, 1979, Ser. No. 66,688**
**Int. Cl.³ B65G *67/02***
**U.S. Cl. 414—337** **16 Claims**



1. A rotary loader having a single vertical pivot about which the loader revolves and at least one load arm which rotates about said pivot, means for engaging said arm with a relatively moving vehicle, a turntable mounted opposite said pivot for engaging and supporting a load, and means for aligning said turntable parallel to said vehicle in register for transfer of said load to or from said vehicle when moving past said loader engaged therewith.

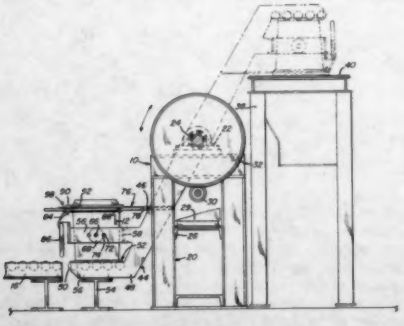
---

**4,370,087**

## DUMPING APPARATUS FOR PARTICULATE-BEARING CONTAINER

**James N. Shepard, Clayton, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Nov. 13, 1980, Ser. No. 206,581**
**Int. Cl.³ B65G *65/34***
**U.S. Cl. 414—421** **5 Claims**



1. Dumping apparatus comprising:

a stationary base including oppositely spaced, upstanding structural members;

pivot means on said base including a transverse shaft extending between said structural members and journalled for rotation on the upper ends thereof;

a frame including spaced, parallel arms, one end of each being secured to the respective ends of said shaft, and a container-receiving platform extending between and attached to the other end of said arms;

a container closure including an elongate plate pivotally secured at an end between the arms of said frame at a location intermediate the ends of said arms to dispose the free end of said plate substantially horizontally over a container supported on said platform, an opening in said plate for disposition over the top of said container when said plate is horizontally disposed thereover; and a slide plate slidably mounted on said elongate plate for selectively opening or closing said container; and

drive means for pivoting said frame between a loading position for receiving said container and a discharge position in which said container is inverted.

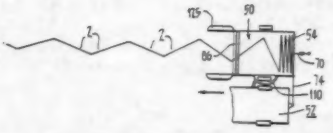
---

**4,370,088**

## PORTABLE FENCING LOADING MEANS

**Peter F. McShane, "Woodspring" Bothwell, Tasmania, 7411, Australia**

**Filed Nov. 3, 1980, Ser. No. 203,214**
**Int. Cl.³ B60P *1/52, 3/00***
**U.S. Cl. 414—439** **8 Claims**



7. A trailer for loading and unloading a portable fence, which has sections which fold together, said trailer having a base for supporting the fence, a roller means adjacent said base at the rear of the trailer and means for driving said roller means at least when the fence is to be loaded, said roller means extending across the base of the trailer, at least substantially the length of the sections of the fence, to thereby assist passage of the fence onto the trailer during loading, said trailer having releasable retaining means disposed along at least one side of the trailer, the releasable retaining means being biased into a position in which it projects into the trailer so that as the fence sections are loaded onto the trailer the sections are able to push past the retaining means to be held on the trailer by the retaining means and are held from moving off the trailer by the releasable retaining means until the retaining means is released.

---

**4,370,089**

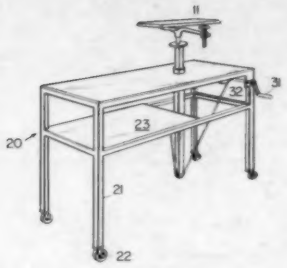
## HOISTS

**Clyde H. Hoster, 12-14 Austin St., Newstead, Queensland 4006, Australia**

**Filed Aug. 27, 1980, Ser. No. 181,700**
**Int. Cl.³ B65G *7/08***
**U.S. Cl. 414—589** **9 Claims**

1. A hoist suitable for the elevation and lowering of vehicle transmissions comprising a support member, a frame, an actuating cable anchored to the frame, and control means for controlling movement of the cable, said actuating cable operably engaging the support member to cause elevating and lowering thereof, and the actuating cable being anchored to a lower plate which is pivotally attached to said frame so as to be tiltable about a horizontal axis, said lower plate having an aperture through which said support member passes, the lower

plate normally assuming a horizontal position during use but tilting about said horizontal axis to engage said frame and




thereby lock the support member in position if the actuating cable is parted.

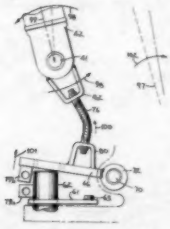
---

**4,370,090**

## BOOM LOCK

**John F. Shumaker, Mt. Pleasant, and Herman J. Maurer, Burlington, both of Iowa, assignors to J. I. Case Company, Racine, Wis.**

**Filed Jul. 7, 1980, Ser. No. 166,060**
**Int. Cl.³ E02F *3/32***
**U.S. Cl. 414—694** **7 Claims**



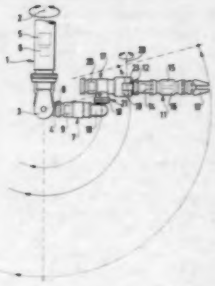
1. In an earthworking machine having a boom pivoted on a frame about a horizontal pivot axis between raised and lowered positions by a first fluid ram joining said frame and said boom; a material handling implement pivoted intermediate its ends on the other free end of said boom about a horizontal pivot axis between folded and extended positions by a second fluid ram having one of its piston rod and cylinder elements pivotally connected to said material handling implement adjacent one free end thereof and the other of its piston rod and cylinder elements pivoted on said boom adjacent said frame; and releasable lock means for locking said boom relative to said frame to prevent pivotal movement of the boom about its horizontal pivot axis, said releasable lock means comprising: a first member secured to said frame; a second member pivotally mounted relative to said boom and disposed adjacent said first member; and biasing means extending directly between and rigidly affixed to said second member and said other piston rod and cylinder elements of said second fluid ram for urging said second member to pivot away from said first member when said second fluid ram is actuated to unfold said material handling implement relative to said boom and for urging said second member to engage said first member when said implement is folded relative to said boom and said boom is pivoted to the raised position whereby said second member engages said first member to lock said boom relative to said frame.

**4,370,091**

## REMOTE MANIPULATOR ARM

**Georges Gagliardi, Clamart, France, assignor to Ateliers et Chantiers de Bretagne, Nantes, France**

**Filed Jul. 18, 1980, Ser. No. 170,239**
**Claims priority, application France, Jul. 18, 1979, 79 18646**
**Int. Cl.³ B25J *11/00*; G21F *7/06***
**U.S. Cl. 414—735** **5 Claims**



1. A remote manipulator arm comprising an articulated assembly connecting a manipulator to a support, said articulated assembly being built up from a plurality of independently motorized arm components each of which comprises at least one motor and an elongate body equipped with an axially-directed fixed coupling at one end and with a moving portion at its other end, said moving portion being caused to move relative to the body under the control of said at least one motor, and being constituted, in the case of an end component, by said manipulator, and in the case of any other arm component by a moving coupling for connection to the fixed coupling of an adjacent arm component, said support being equipped with a moving coupling for connection to the fixed coupling of the first arm component of the articulated assembly; the improvement wherein at least one of said arm components further comprises at least one intermediate fixed coupling located on the side of its body between its ends and directed at 90° to the axis of the body, said intermediate fixed coupling being identical to the axially directed fixed coupling of said one arm component interchangeably useable with the fixed end coupling connection to a moving coupling of another arm component thereby providing an arm component capable of being arranged in the articulated arm assembly in at least two different configurations relative to the moving coupling to which it is connected reducing the distance between the main articulation and the load borne by the manipulator thereby giving rise to a greater lifting power and providing a three component arm with practically the same lifting power as prior two component arms.

---

**4,370,092**

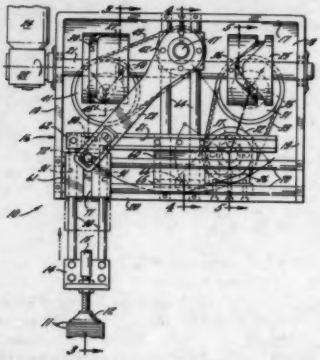
## PARTS HANDLING MACHINE

**Francis L. Healy, c/o Automatic Tool Co., P.O. Box 3146, 1233 Broadway Ct., Rockford, Ill. 61106**

**Filed Sep. 22, 1980, Ser. No. 189,893**
**Int. Cl.³ B66C *23/00***
**U.S. Cl. 414—752** **9 Claims**

6. A parts handling machine adapted to pick up, transfer and place a part, said machine comprising a support, a first carriage mounted on said support to move back and forth along a first substantially linear path, a second carriage mounted on said first carriage to move with said first carriage and to move back and forth relative to said first carriage along a second substantially linear path extending substantially perpendicular to said first path, means on said second carriage and selectively operable to pick up and release a part, power-rotated shaft means

mounted on said support, first and second cams rotatable with said shaft means, first and second pairs of wheels rotatably mounted on said support, one wheel of each pair being larger in diameter than the other wheel of the pair, means connecting the large wheel of each pair to the respective cams and operable to oscillate the large wheels in response to rotation of the cams, endless drives trained around the wheels of each pair and operable to transmit oscillation of the large wheel of each pair to the small wheel of the pair, means connected between said first carriage and the small wheel of said first pair and operable to reciprocate said first carriage back and forth along said first path in response to oscillation of such wheel, means connected



between said second carriage and the small wheel of said second pair and operable to reciprocate said second carriage back and forth along said second path in response to oscillation of such wheel, said last-mentioned means comprising an arm connected to oscillate with the small wheel of the second pair, a third carriage, means connecting said arm to said third carriage and operable to reciprocate said third carriage back and forth along a path extending substantially parallel to said second path when said arm is oscillated, and means connecting said third carriage to said second carriage and operable to move said second carriage with said third carriage and to guide said second carriage for movement relative to said third carriage and along said first path.

---

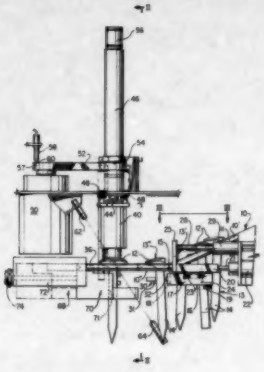
**4,370,093**

## SPIKE ORIENTER

**Raymond R. Lund, West Columbia, S.C., assignor to Canron Corporation, Columbia, S.C.**

**Filed Nov. 19, 1979, Ser. No. 95,795**
**Int. Cl.³ B65H** *9/10*
**U.S. Cl. 414—779** **8 Claims**

1. Apparatus for orientating a railway spike of the type having a head provided with a projecting lip so that the lip is aligned substantially in a predetermined angular position with respect to a vertical axis extending axially through the spike, the apparatus comprising holding means for holding the spike substantially vertically, drive means coupled to the holding means for rotating the spike about its vertical axis, a first sensor and a second sensor, the first sensor sensing the angular position of the lip as the spike is being rotated and the second sensor sensing every 90° rotation of the spike with respect to a reference position, the first and second sensors being coupled to the drive means to cause de-energization of the drive means when the first sensor indicates the projecting lip has reached



the predetermined position and when the second sensor indicates that a 90° position has been reached.

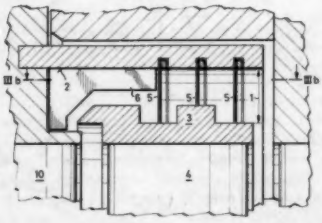
---

**4,370,094**

## METHOD OF AND DEVICE FOR AVOIDING ROTOR INSTABILITY TO ENHANCE DYNAMIC POWER LIMIT OF TURBINES AND COMPRESSORS

**Friedrich Ambrosch, and Rudolf Schwaebel, both of Nüremberg, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nüremberg, Fed. Rep. of Germany**

**Continuation of Ser. No. 716,246, Aug. 20, 1976, abandoned, which is a division of Ser. No. 562,235, Mar. 26, 1975, abandoned. This application Nov. 2, 1978, Ser. No. 957,290**
**Int. Cl.³ F01D** *5/20*
**U.S. Cl. 415—172 A** **4 Claims**



1. In a turbine driven by a fluid medium, wherein the turbine includes: a rotor having blades projecting therefrom, the blades being surrounded by an annular shroud; a stator surrounding but in spaced relation to the shroud to define an annular space between the stator and the shroud, and a labyrinth seal disposed in the annular space, the labyrinth seal including a plurality of axially spaced, annular plates extending radially from the stator toward the shroud, the improvement characterized by:

a plurality of baffle plates mounted on the stator positioned in spaced relation to one another in the annular space between the shroud and stator, each baffle extending both radially and axially within the space and having an inward radial extent in the annular space slightly less than the radial extent of the seal plates whereby differentials in fluid pressure around the annular space are reduced resulting in reduction of self-excited oscillations of the rotor and

thereby allowing an increase in the power imparted to the blades of the turbine.

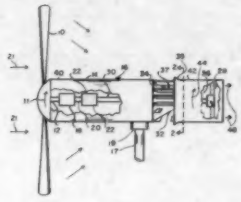
---

4,370,095

## COMPOUND COAXIAL WINDMILL

H. Prescott Sleeper, Jr., 500 Flemington Rd., Huntsville, Ala. 35802

Filed Nov. 3, 1980, Ser. No. 203,319
Int. Cl.³ F03D 1/02
U.S. Cl. 416—175 8 Claims



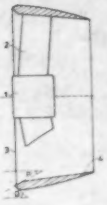
1. A compound coaxial windmill comprising:
a support;
an elongated body;
an axle rotatably supported along an elongated dimension of said body and extending to one end of said body;
mounting means for rotatably supporting said body on said support about a vertical axis, an axis perpendicular to said axle;
a propeller of a diameter significantly larger than the cross-sectional dimensions of said body, and said propeller being attached to and adapted to drive said axle;
an air inlet extending around a peripheral region of said body spaced from said propeller, and a first baffle having a generally conical outer surface concentric with said axle, over which peripheral air passes through said inlet to an inner region of said body;
an induction fan positioned concentrically with respect to said outer conical surface and adapted to draw in air over said conical surface;
a first baffle positioned between said fan and an end of said body opposite to that having said propeller, with the small diameter end of said outer conical surface of said baffle being nearest to said fan;
a second baffle, between said fan and said propeller, having an outer conical surface concentric with said axle, and having its small end adjacent to the exit end of said fan adjacent to the exit air flow end of said fan, and an air outlet extending around a peripheral region of said body between said fan and said propeller;
drive means for generally driving said induction fan at a higher rotational rate than said propeller turns;
an electrical generator coupled to said shaft; and
a plurality of vanes positioned in said air inlet, and over which vanes air would enter and then be drawn over said conical surface of said baffle by said induction fan, and said vanes being oriented with their surfaces lying generally in a plane parallel to the axis of said axle, but lying at an angle with respect to a radial line through the axis of said axle;
whereby entering air is drawn in from around the side of said body and flows inward over the conical surface of said first-named baffle, is driven rotationally in the same direction as the direction of rotation of said induction fan, is drawn through said fan and outward over said second baffle, and then flows generally along said body to said propeller.

4,370,096

## MARINE PROPELLER

Leslie G. Church, Auckland, New Zealand, assignor to Propeller Design Limited, Manurewa, New Zealand

Filed Aug. 29, 1979, Ser. No. 70,868
Claims priority, application New Zealand, Aug. 30, 1978, 188298
Int. Cl.³ B63H 1/16
U.S. Cl. 416—189 18 Claims



1. A marine ring propeller comprising:
a plurality of elongated propeller blades positioned around a central hub, each blade having leading and trailing edges which are straight and parallel to each other, each blade being smoothly curved concavo-convex in cross-section with the leading edges being beveled to be substantially parallel to the plane of rotation of the propeller; the cross-section of each blade being constant along the length of the blade;
a shroud shaped as an annular wall fixed to the outer ends of the blades and having an inner surface and outer surface, the inner surface being frusto-conical so as to be converging toward the downstream end of the propeller at an angle between 1° and 15° to the rotational axis; said inner surface being substantially flat from the trailing edge of the annular wall forward to a point axially forward of the point of contact with the leading edge of the propeller blade; said outer surface being essentially of smoothly curved convex shape when viewed in cross-section.

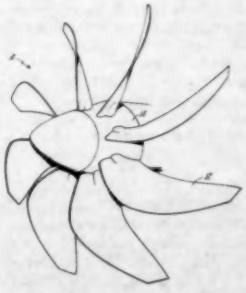
---

4,370,097

## NOISE REDUCTION MEANS FOR PROP-FAN

Donald B. Hanson, Broad Brook, and Frederick B. Metzger, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 16, 1979, Ser. No. 58,046
Int. Cl.³ B64C 11/18
U.S. Cl. 416—228 2 Claims



1. A prop-fan having a plurality of rotatable blades supported in a hub for pitch change movement, the airfoil section having a solidity factor of 1 or greater adjacent the root and

less than 1 adjacent the tip and operable at a speed where the Mach No. is critical or above critical and the tip speed is transonic or supersonic, said blade having a preascertained sweep distribution which for a given Mach surface for both the trailing and leading edge at a given operating condition said trailing edge is behind the trailing Mach surface and said leading edge is behind said leading Mach surface.

---

**4,370,098**

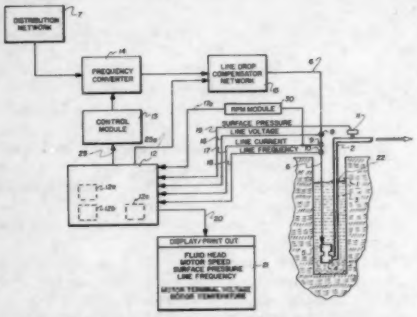
## METHOD AND APPARATUS FOR MONITORING AND CONTROLLING ON LINE DYNAMIC OPERATING CONDITIONS

**James E. McClain; William D. Dickson, and Howard L. Scott, all of Greenville, Tex., assignors to ESCO Manufacturing Company, Greenville, Tex.**

**Filed Oct. 20, 1980, Ser. No. 198,353**

**Int. Cl.³ F04B 49/06**

**U.S. Cl. 417—18** **15 Claims**




1. In a well pumping operation of the type including a motor driven pump submerged within, and for pumping, the well fluid within a well, a conduit in fluid communication with the pump and extending to the top of the well, and a suspended cable extending into the well for supplying electrical power to the motor driving the pump,

a system for monitoring and controlling the dynamic on line operating conditions of said well pumping operation, said system comprising:

(a) stored program computer means having memory segments respectively containing encoded data representative of at least one of the fixed characteristics of the motor, pump, and well;

(b) means coupled to said cable at the surface of the well for generating data signals representative of at least one characteristic of the power being supplied to the motor;

(c) program means within said computer defining the mathematical relationship between a dynamic on line operating condition as a function of the said at least one fixed characteristic and the said at least one power characteristic; and

(d) means under the control of said program means for generating signals continuously representative of said dynamic on line operating condition in response to the receipt by said computer means of said data signals.

---

**4,370,099**

## DISCHARGE GAS TEMPERATURE CONTROL

**Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Nov. 14, 1977, Ser. No. 851,052**

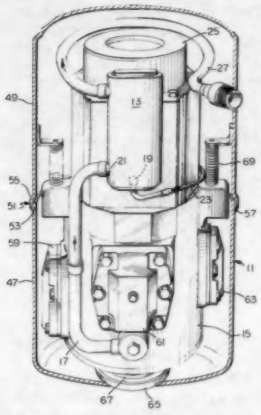
**Int. Cl.³ F04B 49/02**

**U.S. Cl. 417—32** **14 Claims**

1. In a hermetic motor-compressor unit for a refrigeration system having a compressor, an evaporator and a condenser in a series refrigerating circuit, the improvement comprising:

a compressor discharge muffler within the hermetic unit located remote from the compressor and including a pocket extending from the outer surface of the muffler inwardly;

conduit means disposed within the hermetic unit forming a part of the refrigerating circuit and coupling hot gas from the compressor to the discharge muffler in the vicinity of the muffler pocket;




a heat sensitive element supported in the discharge muffler pocket and in good heat transfer relation with the compressed gas entering the discharge muffler to provide an indication of the temperature of that compressed gas; and

circuitry coupling the heat sensitive element in controlling relation to the unit motor for disabling the motor when the temperature of the compressed gas entering the discharge muffler from the conduit means exceeds a maximum desired operating temperature.

---

**4,370,100**

## REGULATING DEVICES FOR HYDROSTATIC DRIVE UNITS

**Franz Forster, Muhlbach, and Harald Stein, Schaafheim, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany**

**Filed Jul. 24, 1980, Ser. No. 171,895**

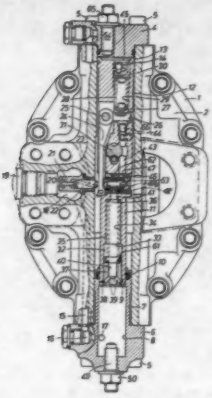
**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930139**

**Int. Cl.³ F04B 49/00**

**U.S. Cl. 417—218** **8 Claims**

1. A regulating device for a hydrostatic drive unit such as a hydropiston pump with a housing having therein an adjusting piston designed as a differential piston having end faces of different areas connected with the final control element of at least one of a variable displacement motor and a variable displacement pump whereby the stroke of said pump or motor is varied and under pressure from both sides and with a control valve in said piston controlling the pressures exerted on the adjusting piston in the pressure spaces in front of the end faces the improvement comprising at least one control pressure metering piston arranged in a sliding manner in the housing and on which the working pressure of at least one of the drive unit and feed pressure of the pump is exerted, a lever which lies against said metering piston and which is connected through a flexible coupling with the adjusting piston and is supported on this latter, a spring forcing said lever against the piston and actuating the control valve, said control valve being located in the adjusting piston crosswise to its longitudinal axis, said lever being in the form of an angle lever, said spring being located in the adjusting piston and lying against the section of the angle

lever extending approximately crosswise to the longitudinal axis of the adjusting piston and designed as a pressure spring,



whose longitudinal axis runs parallel to that of the adjusting piston.

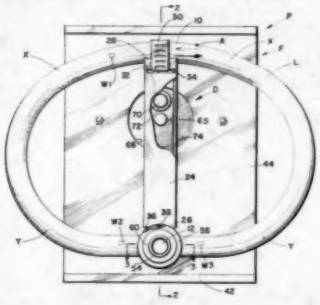
---

**4,370,101**

## CONSTANT DELIVERY INERTIA PUMP

**John Vander Horst, 28153 War Admiral Trail, Evergreen, Colo. 80439**

**Filed Aug. 18, 1980, Ser. No. 178,869**
**Int. Cl.³ F04F 7/00**
**U.S. Cl. 417—241** **10 Claims**



1. In an inertia pump: means defining a fluid-containment loop having at least a portion thereof capable of being oscillated to and fro relative to the environment in the direction of fluid movement therethrough, an inlet connectable to a source of pumpable fluid connected into said fluid containment loop for delivering fluid thereto and an outlet connected to receive fluid therefrom, said inlet and outlet connections cooperating to segment said loop and divide the interior thereof into first and second alternate fluid flow paths therebetween, first flow control means located within the first fluid flow path responsive to the flow of fluid therethrough and automatically operative to inhibit reverse flow while permitting free forward flow, second flow control means located in the second fluid flow path responsive to the flow of fluid therethrough and automatically operative to inhibit reverse flow while permitting free forward flow, and means connected to said oscillatable portion of the fluid-containment loop for oscillating same relative to its surroundings in the direction of fluid movement therethrough, said first and second flow control means cooperating when said loop is thus oscillated to maintain an uninterrupted flow of fluid between said inlet and outlet, fluid flowing from said inlet to said outlet by passing completely through both of said first and second alternate flow paths on an alternating basis.

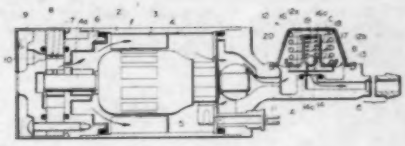
---

**4,370,102**

## FLUID PUMPING DEVICE

**Michiaki Sasaki, Yokohama; Kiyokazu Yamamoto, and Ko Hiratsuka, both of Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited and Jidosha Denki Kogyo Kabushiki Kaisha, both of Yokohama, Japan**

**Filed Jan. 23, 1981, Ser. No. 227,638**
**Claims priority, application Japan, Jan. 31, 1980, 55-10687[U]**
**Int. Cl.³ F04B 49/02, 47/08**
**U.S. Cl. 417—296** **4 Claims**



1. A device for pumping fluid, including a main fluid pump device and an auxiliary device, the main pump device having a fluid intake passage and a fluid supply passage, the auxiliary device being fixed at the side of the fluid supply passage,

the auxiliary device comprising:

a first room communicating with the fluid supply passage of the main pump device;

a second room;

a diaphragm for separating the first room from the second room in such a way that the diaphragm can be actuated in response to the change of the fluid pressure within the first room;

a valve seat formed in the first room;

a first spring;

a valve body attached to the diaphragm and biased by the first spring toward the valve seat so that the valve body can move against the biasing force of the first spring to depart from the valve seat when the fluid pressure in the first room increases although the valve body contacts normally the valve seat due to the biasing force of the first spring;

an outlet passage having one end which is opened to the first room and regulated by the valve body in cooperation with the valve seat so that the fluid flow can be modulated from the first room into the outlet passage;

a relief passage formed in the valve body to be connected at its one end to the first room and at its other end to the second room;

a relief valve for controlling the relief passage; and

a second spring for biasing the relief valve toward the relief passage so as to close the relief passage due to the biasing force of the second spring,

whereby the auxiliary device can function as a damper, cut-off valve, check valve and relief valve.

---

**4,370,103**

## PISTON PUMP WITH DISCHARGE VALVE, INLET VALVE AND MISALIGNMENT COMPENSATING MEANS IN A PUMP HEAD

**Dwight E. Tripp, Longview, Tex., assignor to Arrowhead Research, Houston, Tex.**

**Filed Apr. 28, 1980, Ser. No. 144,790**
**Int. Cl.³ F04B 21/02, 49/02**
**U.S. Cl. 417—298** **29 Claims**

1. A piston pump mechanism for positive gas pressure and vacuum pumping operations, said piston pump mechanism comprising:

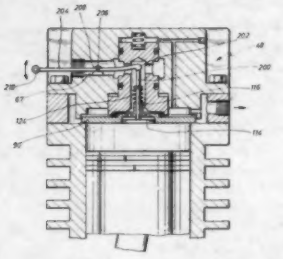
pump body means defining cylinder means therein, said pump body means defining seat means circumscribing said cylinder means and further defining discharge chamber means surrounding said seat means;

a pump head being affixed to said pump body means and cooperating therewith to define a discharge chamber surrounding said seat means and defining an inlet chamber;

piston means being movably disposed within said cylinder means;

means for imparting reciprocating movement to said piston means within said cylinder means;

discharge valve means defining sealing surface means, said sealing surface means adapted to establish sealing engagement with said seat means said discharge valve means being movable to the open position thereof by gas pressure within said cylinder to allow discharge of gas from cylinder means into said discharge chamber means and



being moved to the closed position thereof by at least one of gas pressure within said discharge chamber means and mechanical urging means;

inlet valve means being defined in said discharge valve means and communicating with said cylinder means and with said inlet chamber, said inlet valve means adapted to open responsive to negative pressure within said cylinder means to allow inlet of gas into said cylinder and adapted to close responsive to positive gas pressure within said cylinder means to allow compression of gas within said cylinder;

valve control spool means being movably positioned within said pump head; and

location control means being interposed between said spool means and discharge valve means, said location control means providing lateral and pivotal control for said discharge valve and defining omnidirectional pivot means allowing pivoting of said discharge valve to accommodate seat and head misalignment.

---

**4,370,104**

## SUCTION MUFFLER FOR REFRIGERATION COMPRESSOR

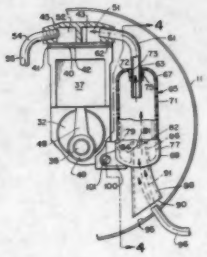
**Richard T. Nelson, Worthington, and Marc G. Middleton, West Jefferson, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio**

**Filed Jul. 22, 1980, Ser. No. 171,194**

**Int. Cl.³ F04B** *39/00*

**U.S. Cl. 417—312** **6 Claims**

1. In a hermetic refrigeration compressor comprising a case having discharge and return lines secured thereto, a motor compressor unit mounted inside said case and including a cylinder housing and a cylinder head secured to said cylinder housing, said cylinder head including an inlet port and a discharge port, discharge muffler means connecting said discharge port to said discharge line, and a suction muffler connected to said inlet port, the improvement comprising said suction muffler comprising an elongated hollow shell of plastic insulating material, said shell having a sidewall and a pair of end walls defining an enclosed chamber, one of said end walls having an outlet opening from said enclosed chamber, said one end wall having a tubular projection around said outlet opening and extending into said enclosed chamber, a suction tube fixedly secured to said cylinder head and extending through said outlet opening into said enclosed chamber and contacting



said tubular projection with a sliding push fit, the other of said end walls having an inlet opening into said enclosed chamber, an outwardly flaring horn around said inlet opening extending adjacent said case at said return line so that refrigerant from said return line is directed into said horn and said enclosed chamber with a minimum of turbulence.

---

**4,370,105**

## AUTOMATIC PUMP FOR DEEP WELLS

**Kenard D. Brown, 3451 Terrace Knoll Ct., Reno, Nev. 89512**

**Division of Ser. No. 951,785, Oct. 16, 1978, which is a continuation-in-part of Ser. No. 651,512, Jan. 22, 1976, Pat. No. 4,120,612. This application Mar. 3, 1981, Ser. No. 240,164**

**Int. Cl.³ F04B** *35/02, 17/00*

**U.S. Cl. 417—360** **10 Claims**

1. A deep well pump assembly including an upwardly extending cylindrical housing having therein a liquid pump and an electric motor for driving said pump, said pump having an intake for receiving liquid from a well and an outlet for discharging liquid under pressure through said housing,

means for suspending said assembly on a wire line for insertion, lowering and positioning in a well casing,

an inflatable packer mounted about the outside of said housing above said pump intake for providing a seal between said housing and the well casing whereby said pump may be utilized for pumping liquid upwardly through the well casing,

a gas discharge outlet for said packer,

a valve for controlling said gas discharge outlet of said packer,

means for opening said valve upon tensioning of said wire line and for closing said valve upon the release of the tension on said wire line,

a cylinder of gas under pressure mounted in said housing and connected for supplying gas from said cylinder to said packer and having a cylinder gas discharge control valve, and timing means for opening said cylinder gas discharge

control valve after a preselected time interval for inflating said packer after said assembly has been positioned in the well and the tension on said wire line has been released to close said packer discharge outlet valve, said packer being deflated by the opening of said packer discharge outlet valve upon subsequent tensioning of the wire line.

---

**4,370,106**

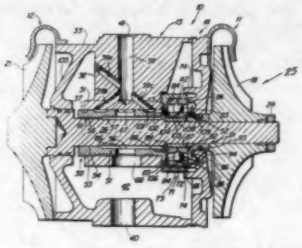
## BEARING ASSEMBLY FOR HIGH SPEED SHAFT

**Jerre F. Lauterbach, Columbus, Ind., assignor to Cummins Engine Company, Columbus, Ind.**

**Continuation-in-part of Ser. No. 18,926, Mar. 9, 1979, abandoned. This application Nov. 1, 1979, Ser. No. 90,346**

**Int. Cl.³ F04B** *17/00, 35/00;* **F16C** *21/00*

**U.S. Cl. 417—407** **21 Claims**



**13**. In a turbocharger for an internal combustion engine, the improvement comprising a bearing housing having a shaft bore formed therethrough, a shaft extending through said bore and having a turbine end adapted to be secured to a turbine wheel and a compressor end adapted to be secured to a compressor wheel, a bearing assembly mounted in said bore and supporting the radial and axial thrust loads of said wheels, said assembly comprising a sleeve, resilient mount means connecting said sleeve to said housing for floatingly supporting said sleeve in said housing, hydrodynamic bearing means on said sleeve adjacent said turbine end of the shaft for supporting said radial load, bearing support means on said sleeve adjacent said compressor end of the shaft, anti-friction bearing means mounted in said bearing support means and connected to said shaft, said anti-friction bearing means supporting said radial load at said compressor end, and means operatively connecting said anti-friction bearing means and said bearing housing for supporting axial thrust from said shaft in both directions.

---

**4,370,107**

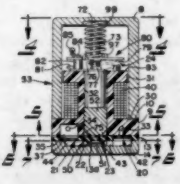
## SPRING BIASED FLUID PUMP

**Bruce J. Landis, 11850 NW. 31st Pl., Sunrise, Fla. 33304, and Paul R. Goudy, Jr., Milwaukee, Wis., assignors to Kenneth J. Landis, University Heights, Ohio; Bruce J. Landis, Sunrise, Fla. and Paul R. Goudy, Jr., Milwaukee, Wis.**

**Filed Jan. 4, 1980, Ser. No. 109,544**

**Int. Cl.³ F04B** *43/04*

**U.S. Cl. 417—413** **7 Claims**



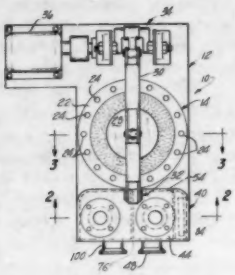
**1**. A fluid pump, comprising a fluid inlet and a fluid outlet; a pumping chamber; an inlet check valve means for passing fluid flow from said fluid inlet to said pumping chamber and for blocking fluid flow from said pumping chamber to said fluid inlet; an outlet check valve means for passing fluid flow from said pumping chamber to said fluid outlet and for blocking fluid flow from said fluid outlet to said pumping chamber; pumping means for drawing fluid from said fluid inlet via said inlet check valve into said pumping chamber and for pumping fluid from said pumping chamber via said outlet check valve to said fluid outlet; first and second energy storage means for providing work input to said pumping means respectively to effect such drawing and pumping of fluid; power means for intermittently supplying work for storage as potential energy in said energy storage means; said first and second energy storage means respectively comprising a first spring for supplying work to said pumping means to draw fluid into said pumping chamber and a second spring for supplying work to said pumping means to pump fluid from said pumping chamber and to store energy in said first spring; said pumping means comprising an integral flexible member, said first and second springs being positioned with respect to said flexible member to supply work to opposite sides thereof without interrupting the fluid-tight integrity of said flexible member; a first relatively rigid member having a first plate-like surface and said pumping chamber being formed in said first relatively rigid member and opening at said first surface and being bounded at said first surface by boundary portions of said first surface, a second relatively rigid member having a second plate-like surface and an internal passage in said second relatively rigid member opening at said second surface and being bounded at said second surface by boundary portions of said second surface, said flexible member being positioned between said first and second plate-like surfaces for cooperating with said boundary portions to provide a substantially fluid-tight seal therewith; work transmitting means for transmitting work between said second spring and said flexible member; said power means comprising an actuator and said work transmitting means comprising a movable member of said actuator, said actuator comprising a solenoid, said work transmitting means comprising a movable magnetically responsive core of said solenoid, said work transmitting means being engageable with but not fastened to said flexible member; and energizing means for intermittently completing an electrical circuit to provide electrical power to said power means, said means for intermittently completing comprising a carrier for undergoing repeatable movement, comprising a curved arm having a tendency to assume a natural condition when at least substantially unstressed, a resilient characteristic operative generally in a direction at least approximately perpendicular to that in which a radius of curvature of said curved arm is taken, and a pair of ends, one being relatively fixedly supportable and other being relatively movable with respect to said one end; and means for applying force to said other end in a direction at least approximately parallel to that in which such resilient characteristic is generally operative causing resilient deformation of said curved arm to cause movement of said other end with respect to said one end; said curved arm also having a tendency to reassume its natural condition when not having been stressed beyond its elastic limit by such force and such force is removed; said curved arm comprising a generally flat arm having a generally circular shape, said means for applying force comprising a radial arm integral with said curved arm, and said second spring being positioned to apply force to said radial arm tending to cause resilient deformation of said curved arm.

4,370,108

## DIAPHRAGM PUMP

Joseph H. Brill, 5210 E. Deckerville Rd., Deckerville, Mich. 48427

Filed Mar. 24, 1980, Ser. No. 133,240
Int. Cl.³ F04B 21/02, 39/10, 15/02
U.S. Cl. 417—430 2 Claims



1. A pump comprising:

a pump housing including a pumping chamber section, having a top wall formed with an upper surface thereof defining in part a pumping chamber within said pumping chamber housing;

a generally circular opening formed into said upper wall;

a flexible diaphragm overlying said generally circular opening;

means mounting said diaphragm to said upper surface whereby said pumping chamber is defined in part by said flexible diaphragm;

means for causing reciprocating flexing movement of said diaphragm toward and away from said pumping chamber;

said pump further including a valve housing section adjoining said pumping chamber, said valve section including an inlet compartment located at the level of said pumping chamber including an inlet fitting for connection to the supply of liquid to be pumped thereby;

an inlet valving chamber having upper and lower walls extending parallel to said top wall of the pump housing located above said inlet compartment;

an inlet valve port passing between said inlet compartment and said inlet valving chamber;

valving means controlling communication of said inlet compartment and said inlet valve chamber including a valving disc overlying said inlet valve port;

fluid passage means establishing communication of said inlet valving chamber with said pumping chamber,

whereby inlet flow passes into said passage and thence into said pumping chamber;

an outlet compartment having upper and lower walls extending parallel to said top wall of the pump housing located alongside said inlet chamber in open communication with said pumping chamber;

an outlet valving chamber having upper and lower walls extending parallel to said top wall of the pump housing located above said outlet compartment and an outlet valve port establishing communication between said outlet compartment and said outlet valving chamber;

outlet valving means controlling communication through said outlet port, said outlet valving means including an outlet valving disc overlying said outlet valve port;

outlet means for said outlet valving chamber;

whereby inlet flow is drawn into said pumping chamber during upward movement of said diaphragm and lifting of said inlet valve disc to enable inflow into said pumping chamber and upon downward stroking of said flexible diaphragm outflow from said pumping chamber into said outlet valve chamber takes place due to lifting of said outlet valve from said outlet valve port.

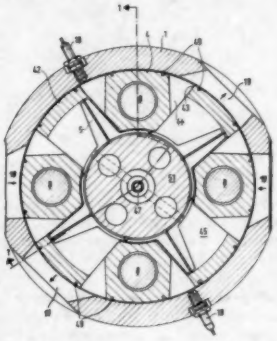
---

4,370,109

## ROTARY PISTON-INTERNAL COMBUSTION ENGINE HAVING A CENTRAL AXIS

Huschang Sabet, Eduard-Pfeiffer-Str. 67, Stuttgart, Fed. Rep. of Germany, and Dietrich Eckhardt, Aichwald, Fed. Rep. of Germany, assignors to Huschang Sabet, Stuttgart, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,065
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1980, 3006940
Int. Cl.³ F02B 55/14; F01C 1/00
U.S. Cl. 418—34 7 Claims

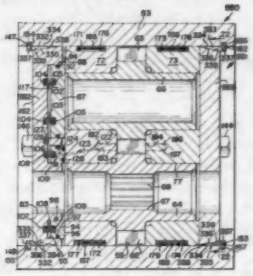


1. Rotary piston-internal combustion engine comprising a stationary engine housing having a central axis, a rotor mounted within said housing for rotation at uniform velocity about the central axis relative to said housing, a driven shaft located within said housing and connected to said rotor, said rotor comprising an open-ended cylinder coaxial with the central axis and an end face member located at and extending transversely across each of the opposite ends of said cylinder, said cylinder having inlet and outlet openings therethrough uniformly spaced about the cylindrical periphery thereof, first pistons connected to and extending radially inwardly from the inner periphery of said cylinder, said first pistons being uniformly spaced apart within said cylinder, an axially extending hub located within said cylinder coaxial with the central axis and being rotatable within said cylinder relative to said first pistons, a number of uniformly spaced second pistons corresponding to the number of said first pistons being secured to and rotating with said hub, said cylinder said end face members and said first pistons defining working chambers within said cylinder with each said second piston being positioned within a different one of said working chambers, sealing means located between the radially outer surface of said cylinder and in contact with said housing for providing a seal around said openings through said cylinder, said first pistons being sector-shaped and having generally radially extending flanks with said flanks defining axially extending sides of said working chambers, said openings in said cylinder being located within the angularly extending range of said first pistons and said openings within the angularly extending range of each said first piston being arranged symmetrically relative to the axially extending center plane of said first pistons.

## 4,370,110
## HIGH PRESSURE GEAR PUMP OR MOTOR WITH AXIAL RETAINING MEANS IN A HOUSING CAVITY

John L. Nagely, Sidney, Ohio, assignor to Fluid Energy Systems Corporation, Sidney, Ohio

Division of Ser. No. 55,332, Jul. 6, 1979, abandoned. This application Aug. 10, 1981, Ser. No. 291,286
Int. Cl.³ F03C 2/08; F04C 2/18
U.S. Cl. 418—132 23 Claims



1. In a liquid displacement device including a housing having a cavity therein and an inlet and outlet communicating with said cavity, said liquid displacement device also including an internal unit assembly mounted in said cavity and removable as a unit therefrom through an end of said cavity, said internal unit assembly including a pair of meshed gears disposed between and rotatably supported by a pair of adjoining end plates, means carried by said internal unit assembly for holding said internal unit assembly in assembled relation, said gears being operable when driven to generate high and low pressure zones in said cavity adjacent to said outlet and inlet, respectively, when said internal unit assembly is mounted in said cavity and said device is in operation, and said internal unit assembly including thrust means coacting with at least one of said end plates and operable to provide a force preventing separation of said end plates from predetermined positions with respect to the side faces of said gears when said liquid displacement device is in operation, the improvement of retaining means mounted in said cavity and coacting with said thrust means so that said internal unit assembly is retained in a predetermined position in said housing cavity with the inlet and outlet in said housing in substantial alignment with said high and low pressure zones, respectively, said retaining means also being adapted to transmit to said housing a portion of the axial component of the force from said high pressure zone tending to separate said end plates from said predetermined positions when said device is in operation and the pressure in said high pressure zone exceeds a predetermined value, said improvement also including means coacting with said retaining means for transmitting to said housing another portion of the axial component of the force tending to separate said end plates from said predetermined positions.

---

## 4,370,111
## ROTARY PUMP OR MOTOR WITH DRIVE ROLLERS AND FREE-FLOATING ROLLERS

Robert H. Shea, 35 Lancester St., Rochester, N.Y. 14615

Continuation-in-part of Ser. No. 89,111, Oct. 29, 1979, abandoned. This application May 6, 1981, Ser. No. 260,272
Int. Cl.³ F01C 1/00, 11/00; F03C 2/00; F04C 2/00
U.S. Cl. 418—212 13 Claims

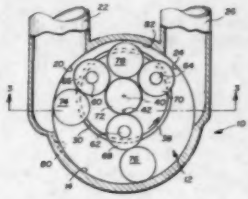
1. A pump or motor construction comprising:

a housing having walls defining a generally cylindrical chamber with an axis, the housing having an inlet opening and an outlet opening communicating with the chamber;

a plurality of drive rollers located within the chamber;

means mounting the rollers (i) for rotation about their respective axis and (ii) for conjoint movement in an annular path about a central axis that is equally spaced from the respective axes of the rollers and eccentrically located relative to the axis of the chamber, each of the rollers being spaced from the housing and from each other during movement about the central axis;

a plurality of free-floating rollers arranged within said chamber so that one of the free-floating rollers is between each two adjacent drive rollers, the free-floating rollers being engageable by the drive rollers during movement of the



drive rollers about the central axis, thereby to advance the free-floating rollers through the chamber and past the inlet opening and the outlet opening, the free-floating rollers precessing about the drive rollers during movement of the drive rollers and the free-floating rollers being in contact with the wall of the chamber as they are advanced through the chamber by the drive rollers; and

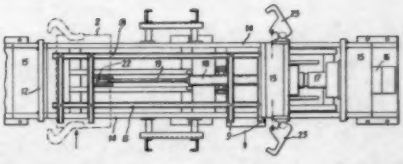
a center free-floating member located between the drive rollers, the free-floating member being closely adjacent to the drive rollers to form therewith a fluid seal.

---

## 4,370,112
## METHOD AND APPARATUS FOR MOLDING ARTICLES FROM AGGLOMERATED PARTICLES

Pierre Sorbier, Pernes-les-Fontaines, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Division of Ser. No. 756,000, Jan. 3, 1977, Pat. No. 4,165,353. This application May 31, 1979, Ser. No. 44,221
Claims priority, application France, Jan. 9, 1976, 76 00525
Int. Cl.³ B02B 1/00
U.S. Cl. 425—3 14 Claims



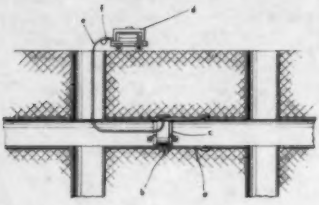
1. A device for molding articles from agglomerated particles comprising, a press, means for supplying pressure to the press, a cyclic circuit comprising a series of molds, said circuit having a section comprising means for forming a row of abutting molds in which the material is maintained under pressure during polymerization, by the face of one mold engaging the material in the next adjacent mold to maintain the material compressed during polymerization, attaching means on each mold for holding a mold in abutting contact with an adjacent mold, means for actuating the attaching means to attach a mold to a last mold of a row of molds, means to detach a first mold of the row of molds from the next adjacent mold, and means for temporarily compressing the last mold of a row against the row of molds.

**4,370,113**

## APPARATUS FOR REPAIRING LEAKS IN UNDERGROUND PIPE

**Yasushi Nakashin, 67-28 Isobe, Chiba-shi, Japan**

**Filed Jul. 9, 1981, Ser. No. 281,774**
**Claims priority, application Japan, Jul. 9, 1980, 55-092663**
**Int. Cl.³ B29D *23/08***
**U.S. Cl. 425—13** **11 Claims**



1. A repair apparatus for repairing leaks in underground pipe or the like comprising:

a movable carriage adapted to enter and be displaced axially along said pipe;

a flexible and stretchable tubular cover sheet surrounding at least a portion of said carriage and adapted to be brought into intimate contact with the internal wall surface of said pipe to cover the leaking part thereof;

a plurality of back-up plates supported by said carriage and expandable radially for pressing said sheet against the internal wall surface of said pipe and retractable for separating said sheet from said wall;

a power-driven mechanism supported by said carriage for actuating said back-up plates; and

a conduit inside said cover sheet and adapted to deliver grout radially outwardly through the approximate axial center of said cover sheet.

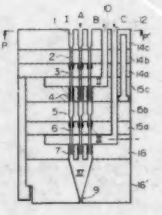
---

**4,370,114**

## SPINNERET ASSEMBLY FOR USE IN PRODUCTION OF MULTI-INGREDIENT MULTI-CORE COMPOSITE FILAMENTS

**Miyoshi Okamoto, Takatsuki, and Miyozo Asada, Kyoto, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Sep. 7, 1979, Ser. No. 73,564**
**Int. Cl.³ D01D *3/00***
**U.S. Cl. 425—131.5** **8 Claims**



1. A spinneret assembly to be fitted in a spinning pack for the production of multi-ingredient multi-core composite filaments comprised of at least three polymer phases A, B and C, which assembly comprises superposed rigid first, second, third and fourth plate members;

said first plate member partitioning off a first polymer chamber, through which a stream of the polymer A flows, from a second or third polymer chamber, through which a stream of the polymer B or C flows, respectively;

said third plate member partitioning off the third polymer chamber from one or more funnel-shaped fourth polymer chambers bored in the fourth plate member, through which combined streams of the polymers A, B and C flow, and said third plate member having bored therein a plurality of holes, the lowermost ends of which are exposed to the or each funnel-shaped fourth polymer chamber;

said fourth plate member having at the lowermost end of the or each funnel-shaped fourth polymer chamber an orifice through which a combined stream of the polymers A, B and C flows; with the proviso that

one of the following requisites (a) and (b) is satisfied:

(a) said second plate member having bored therein a plurality of holes confronting the holes of the third plate member, each pair of confronting holes being connected with each other by a pipe, said pipe extending from the hole of the second plate member toward the hole of the third plate member or from the hole of the third plate member toward the hole of the second plate member, so that a narrow circular path is formed at least around one end portion of said pipe within the hole of the third plate member or the second plate member, respectively, or within another pipe extending from the hole of the second plate member or the third plate member, respectively, and the polymer passage formed within said pipe being connected through said narrow circular path to the third polymer chamber;

(b) said third plate member further having bored therein one or more slits through which streams of the polymer C flow from the third polymer chamber to the funnel-shaped fourth polymer chamber, the or each slit being, on the under surface of the third plate member, of a multi-arm shape having at least three radially extending arms, each of which intervenes between at least two holes of the holes bored in the third plate member,

said first, second, third and fourth plate members forming a plurality of series of linked polymer passages each series having at least one joining point at which two polymer streams join together, at least one of the polymer passages upstream of the joining point having at least one cross section that is narrower than any cross section of the polymer passage downstream of the joining point but upstream of the succeeding joining point, if any, or said at least one polymer passage upstream of the joining point having a length longer than that of the polymer passage downstream of the joining point but upstream of the succeeding joining point, if any;

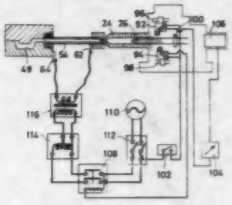
said first rigid plate member having bored therein connecting holes for connecting each pair of the respective confronting holes bored in the first and second plate members and further having bored therein slits extending from a part or all of said connecting holes to the polymer chamber II, whereby the polymer passages formed within a part or all of said connecting holes are connected through said slits to the second polymer chamber so that at least two type core ingredients different in composition are formed in each multi-core composite filament; and at least said first, second and third plate members being capable of being assembled into a single unit by connecting means so that the first, second and third plate members can be fitted in or detached from the spinning pack as the single unit, and said single unit having only one or no polymer-introducing passage which opens at the side wall of the single unit and having two or more polymer-introducing passages which open at the upper face of the single unit so that mutual contamination of the polymers is prevented.

**4,370,115**

## INJECTION MOLDING METHOD AND DEVICE

**Takashi Miura, 1-14-19 Honcho, Asaka-shi, Saitamaken 351, Japan**

**Filed Jul. 28, 1980, Ser. No. 173,038**
**Int. Cl.³ B29F *1/08*; B29G *3/00***
**U.S. Cl. 425—144** **7 Claims**



1. An injection molding device for thermosetting molding materials, which comprises:

an injection means, an intermittent heater, and a mold cavity;

the intermittent heater having a small heat capacity and defining a passage for transmitting molding material from the injection means to the molding cavity;

the passage having a volume less than the volume of the mold cavity and being adapted to being rapidly heated when electricity is supplied to the intermittent heater and rapid cooling when the electricity is interrupted or reduced; and

the intermittent heater and injection means acting in cooperation with the mold cavity so that molding material is uniformally heated to approximately the same temperature as the molding cavity as it flows through the passage during injection and the molding material remaining in the passage between injections is cooled to avoid adverse heat effects.

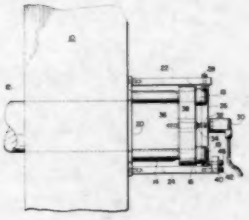
---

**4,370,116**

## TONNAGE INDICATOR FOR INJECTION MOLDING MACHINE

**James S. Groom, Wales, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.**

**Filed Oct. 13, 1981, Ser. No. 310,891**
**Int. Cl.³ B29F *1/06*; B30B *15/14, 15/22, 15/28***
**U.S. Cl. 425—171** **8 Claims**



1. In a plastic injection molding machine having first and second die platens respectively carrying complementary mold parts which are engageable to define a mold cavity, at least one tie bar mounted on the frame of the machine to extend slidably through the platens and having a threaded end portion projecting beyond the first such platen, a nut threaded on said end portion, first means exerting a force between the said first platen and said nut tending to compress the nut under an initial load, the second platen being driven reciprocably along said tie bar whereby to forcefully engage the mold parts to receive injected plastic material in their defined cavity and to separate the mold parts for removal of a plastic article formed in the cavity, and means including a sensor to detect axial movement of the threaded end of the tie bar and thereby to measure compression of said nut caused by the force load across the mold parts when engaged and as such load may be altered by the pressure of plastic material injected into the mold cavity.

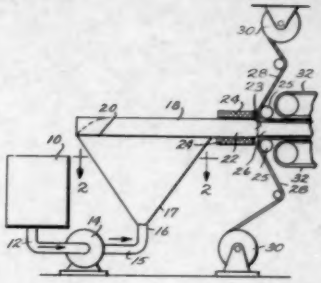
---

**4,370,117**

## FOAMING APPARATUS

**Stuart B. Smith, Conyers, Ga., assignor to Thermoset AG, Lucerne, Switzerland**

**Filed Sep. 5, 1980, Ser. No. 184,617**
**Int. Cl.³ B29B *7/14***
**U.S. Cl. 425—224** **5 Claims**



1. An apparatus for producing insulation material from a foamable composition wherein supply means are used to supply the composition to an expansion chamber and conveying means are used to convey the foam product from the expansion chamber, the improvement comprising said expansion chamber being in the form of a hollow cone having an apex at one end and a base at the opposite end thereof, wall means extending from said base to said apex, inlet means at said apex and outlet means adjacent said base, said outlet means including a nozzle attached to a cover with said cover closing said base of said expansion chamber, said nozzle and cover having walls that flare outwardly from one side of said expansion chamber towards the end of said nozzle located adjacent the opposite side of said expansion chamber.

---

**4,370,118**

## ARRANGEMENT FOR INTRODUCING BANDEROLES OR STRIPS INTO RECEPTACLES

**Jean-Marc Dronet, Falaise, France, assignor to Societe d'Application Plastique Mecanique et Electronique, Falaise, France**

**Filed May 19, 1981, Ser. No. 265,101**
**Claims priority, application France, May 19, 1980, 80 11090**
**Int. Cl.³ B29C *17/00***
**U.S. Cl. 425—305.1** **8 Claims**

1. An improved arrangement for introducing banderoles into receptacles wherein the banderoles **16** are fed into guide passages **1** in which suction mandrels **2** are disposed for looping the banderoles **16**, each guide passage **1** having an inlet slit **3** through which the banderole **16** is cut and introduced by the action of a pair of feed rollers **5** and a transverse cutting knife **6**, the looped banderole **16** being thereafter transferred to a mold **7** by the mandrel **2**,

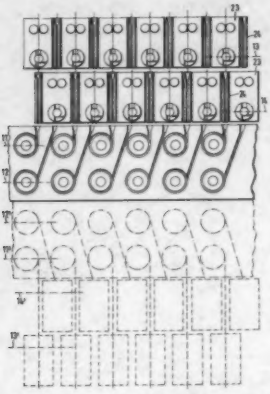
the improvement comprising,

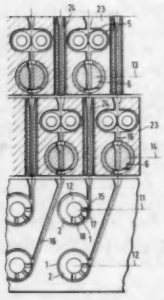
the guide passages **1** are disposed in a plurality of members which are disposed along two parallel lines **11, 12** and are fed with cut banderoles **16** from the same side;

the knives **6** are also disposed along two parallel lines **13, 14** in staggered relationship;

the distance between the cutting edge of a knife **6** and the inlet generatrix of a guide passage **1** is slightly less than the length of a cut banderole **16**; and

the suction mandrel **2** having two suction zones, the first zone **17** outletting into that portion of the suction mandrel **2** which confronts the front end of the banderole **16** which is introduced into the guide passage **1** at the moment the banderole **16** is cut by the knife **6**, and which is coupled to a source of vacuum during the rotating of the mandrel **2**





subsequent to the actuation of the knife **6** until complete looping of the banderole, as well as during the transfer to the mold **7**, the second zone **18** outletting into that portion of the suction mandrel **2** which confronts the rear end of the cut banderole **16** at the end of looping thereof by the rotating mandrel **2**, which second zone **18** is coupled to the source of vacuum only at the end of rotation of the mandrel **2** and during transfer of the banderole **16** to the mold **7**.

---

**4,370,119**

**POWDER PRESS**

**Takashi Watanabe, Iwatsuki, Japan, assignor to Tamagawa Kikai Kabushiki Kaisha, Tokyo, Japan**

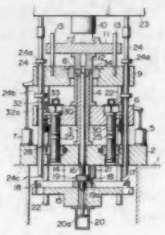
**Filed Sep. 9, 1981, Ser. No. 300,972**

**Claims priority, application Japan, Sep. 9, 1980, 55-124798**

**Int. Cl.**[3] **B30B** *7/02, 11/02, 15/00*

**U.S. Cl. 425—352** **6 Claims**

**1**. A floating die-type powder press comprising a fixed plate secured to a frame, a die plate holding a die in which powder material is to be compacted, said die plate being movable up and down, at least one intermediate plate disposed between said fixed plate and said die plate and movable up and down, an upper punch coupled to an upper ram and movable up and down therewith for pressing down the powder material in said die, at least one floating punch mounted to said intermediate plate and coacting with said upper punch to compact the powder material in said die by exerting an upward pressure thereon, stops mounted to said fixed plate so as to permit adjustment of their vertical position, rotatable stop rods threadedly engaged with said intermediate plate carrying said



floating punch and adapted to make abutting engagement with said stops during the compaction of the powder material for bearing the load thereon, locking members for locking said stop rods against rotation during the compaction of the powder material, and ejector rods for disengaging said stop rods from said locking members and pressing down said die plate and said intermediate plate at the time of the ejection of the compact.

---

**4,370,120**

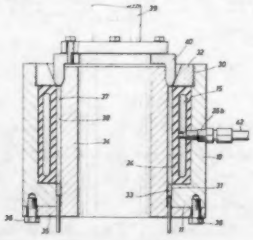
**COMPACTING PRESS WITH EXPANDABLE BODY**

**Robert D. Foster, 1116 Waugh Dr. #4, Houston, Tex. 77019, and Frank G. Weeden, P.O. Box 55156, Houston, Tex. 77055**

**Division of Ser. No. 964,300, Nov. 28, 1978, Pat. No. 4,263,237, which is a division of Ser. No. 684,835, May 10, 1976, abandoned. This application Jan. 23, 1981, Ser. No. 227,916**

**Int. Cl.**[3] **B30B** *11/00*

**U.S. Cl. 425—405 H** **7 Claims**



**1**. A compacting press for particulate materials comprising:

support means including at least one support member having a support surface and a bore opening through said support surface;

an elastomeric body having generally oppositely facing body surfaces, one of said body surfaces abutting said support surface of said support member, and the other of said body surfaces facing into and at least partially defining a particulate-receiving space,

a rigid core embedded in and surrounded by said elastomeric body and having one side facing generally toward said support surface, another side facing generally toward said

particulate-receiving space, and a bore opening through said other side;

conduit means communicatively interconnecting the bores of said support member and said core;

and means for confining particulate material within said particulate-receiving space;

said elastomeric body being bonded to said support surface of said support maember and to said conduit means, but being unattached to said other side of said core, whereby fluid may be injected between the unattached portion of said elastomeric body and said other side of said core via said conduit means to expand the unattached portion of said elastomeric body into said particulate-receiving space and thereby compress particulate material therein.

---

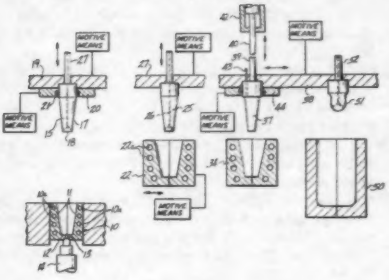
## 4,370,121
## APPARATUS FOR FORMING HOLLOW PLASTIC OBJECTS

**Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471**

**Division of Ser. No. 120,266, Feb. 11, 1980, which is a continuation-in-part of Ser. No. 5,960, Jan. 24, 1979, Pat. No. 4,225,304, which is a division of Ser. No. 911,359, Jun. 1, 1978, Pat. No. 4,207,134. This application Dec. 22, 1980, Ser. No. 218,502**

**Int. Cl.³ B29C *17/07***

**U.S. Cl. 425—526** **18 Claims**




1. An apparatus for forming oriented, blown objects of moldable plastic material requiring prolonged tempering cycles to obtain conditions suitable for orientation which comprises: pressure molding means for forming a parison in a closed mold cavity on a first core; a plurality of tempering molds in spaced relationship to each other and to said pressure molding means for retaining and tempering said parison in a prolonged tempering cycle prior to orientation and blowing; means for relatively moving a first of said tempering molds and said first core into alignment with each other; means for transferring said parison from said first core to said first tempering mold; means for relatively moving said first core and first tempering mold to bring said parison into alignment with means for removing the parison from said first tempering mold and transferring said parison to at least one additional tempering mold spaced from said first tempering mold for prolonged tempering prior to orientation and blowing; a blow mold in spaced relationship with at least one of said tempering molds for forming said tempered parison into an oriented, blown, hollow object; separate means for removing said tempered parison from said at least one additional tempering mold at the end of the tempering cycle prior to orientation and blowing and placing same in said blow mold; and means associated with said blow mold to form an oriented, blown, hollow object in said blow mold, whereby said tempering molds receive and release parisons seriatim and whereby the overall processing cycle is substantially unaffected by the number of tempering molds.

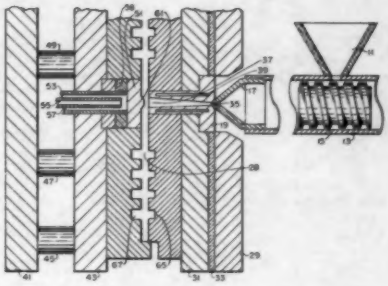
## 4,370,122
## APPARATUS FOR RUNNERLESS INJECTION COMPRESSION MOLDING OF THERMOSETTING MATERIALS

**W. Andrew Dannels, Grand Island, N.Y., and Robert W. Bainbridge, Gainesville, Ga., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.**

**Continuation-in-part of Ser. No. 118,381, Feb. 5, 1980, Pat. No. 4,290,744, which is a continuation-in-part of Ser. No. 972,182, Dec. 21, 1978, abandoned, and a continuation-in-part of Ser. No. 164,412, Jun. 30, 1980, Pat. No. 4,309,379, which is a continuation-in-part of Ser. No. 972,189, Dec. 21, 1978, Pat. No. 4,238,181. This application Jun. 29, 1981, Ser. No. 278,237**

**Int. Cl.³ B29G *3/00*; B29F *1/08***

**U.S. Cl. 425—543** **11 Claims**



1. An improved injection-compression molding apparatus comprising:

a stationary assembly comprised of:

a stationary platen member,

a heat plate mounted thereon, means to heat said plate,

a plurality of mold faces mounted on said heat plate, and

a cooled sprue bushing extending through said stationary assembly having a receiving end adapted to engage the nozzle of an injection molding machine and a discharge end positioned contiguous to said heat plate;

a movable assembly comprised of:

a movable platen member,

a heat plate mounted thereon, means for heating said plate, and

a plurality of mold faces mounted on said heat plate corresponding to and positioned to be aligned with the mold faces on said stationary assembly to form a plurality of mold cavities;

means to move said movable assembly to bring said movable mold faces into close proximity and aligned with corresponding faces in said stationary assembly to form partially open mold cavities and forming a cooled manifold area between the discharge end of said sprue bushing in the stationary assembly and said movable assembly;

means for feeding a supply of plasticized thermo-setting molding material into the receiving end of said sprue bushing into said partially open mold cavities;

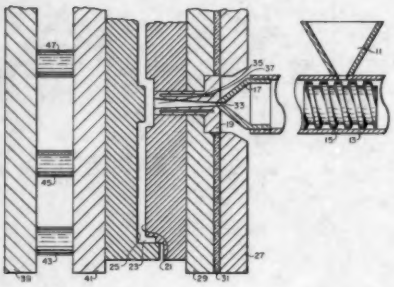
means for closing said partially open mold cavities to a closed stage to cure any thermosetting material enclosed within the mold cavities by pressure and heat and eliminating said manifold area; and

means for retracting said movable assembly to separate said mold faces and remove a molded article.

## 4,370,123
## APPARATUS FOR RUNNERLESS INJECTION COMPRESSION MOLDING OF THERMOSETTING MATERIALS

W. Andrew Dunnels, Grand Island, N.Y., and Robert W. Bainbridge, Gainesville, Ga., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 118,381, Feb. 5, 1980, Pat. No. 4,290,744, which is a continuation-in-part of Ser. No. 972,182, Dec. 21, 1978, abandoned, and Ser. No. 164,412, Jun. 30, 1980, Pat. No. 4,309,379, which is a continuation-in-part of Ser. No. 972,189, Dec. 21, 1978, Pat. No. 4,238,181. This application Jun. 29, 1981, Ser. No. 278,238
Int. Cl.³ B29G *3/00*
U.S. Cl. 425—543 5 Claims

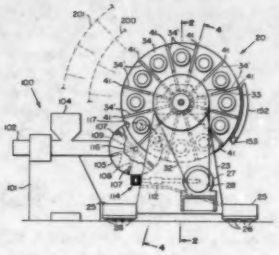


1. An improved injection-compression molding apparatus comprising:
- a stationary assembly comprised of:
  - a stationary platen assembly
  - a heat plate mounted thereon, means to heat said plate,
  - a mold face mounted on said heat plate, and
  - a cooled sprue bushing extending through said stationary assembly having a receiving end adapted to engage the nozzle of an injection molding machine and a discharge end positioned contiguous to said heat plate;
- a movable assembly comprised of:
  - a movable platen member
  - a heat plate mounted thereon, means for heating said plate,
  - a mold face mounted on said heat plate corresponding to and positioned to be aligned with the mold face on said stationary assembly to form a mold cavity;
- means to move said movable assembly to bring said movable mold face into close proximity and aligned with the corresponding face in said stationary assembly to form a partially open mold cavity and bring the discharge end of said sprue bushing in the stationary assembly into direct feed relationship with said partially open mold cavity;
- means for feeding a supply of plasticized thermosetting molding material through said sprue bushing directly into said partially open mold cavity;
- means for placing said partially open mold cavity in a closed stage to cure any thermosetting material enclosed within the mold cavity by pressure and heat while maintaining the discharge end of said sprue bushing in direct feed relationship with the closed mold cavity; and
- means for retracting said movable assembly to separate said mold face and remove a molded article.

## 4,370,124
## MODULAR ROTARY MOLDING MACHINE

Frederick J. Buja, 104 Shale Dr., Rochester, N.Y. 14615

Filed Jun. 17, 1981, Ser. No. 274,472
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—556 24 Claims



1. A rotary molding machine, comprising
- a shaft mounted for rotation about its axis,
- a plurality of rigid plates secured to an surrounding said shaft at axially spaced points therealong, and lying in spaced planes extending transversely of said shaft,
- a plurality of rigid panels secured to said plates to be supported by said plates around the outside of said shaft in angularly spaced planes that extend generally radially of the axis of said shaft,
- a pair of cooperating mold sections mounted in the angular space between each pair of adjacent panels for rotation with said shaft
- means for rotating said shaft to cause the pairs of cooperating mold sections to be rotated successively into a predetermined loading position during each revolution of said shaft,
- means for moving one mold section of each pair thereof from an open to a closed position prior to arrival of said pair of sections at said loading station, and for moving said one mold section back to its open position after a predetermined interval,
- means for injecting a molten molding material into a cavity formed between the confronting surfaces on a pair of said closed mold sections as they pass said loading station, and
- means for ejecting a molded part from said cavity, when said one mold section of a pair thereafter moves to its open position at termination of said predetermined interval.

---

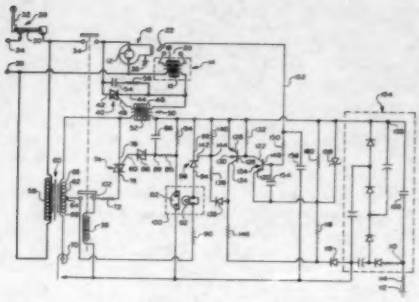
## 4,370,125
## CONTROL SYSTEM FOR BLUE-FLAME OIL BURNER

Donald E. Donnelly, Edwardsville, Ill., and Francis J. Maney, Mahwah, N.J., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 1, 1980, Ser. No. 192,850
Int. Cl.³ F23N *50/00*
U.S. Cl. 431—66 7 Claims

1. In a burner control system,
- a photoconductive cell;
- an incandescent filament lamp coupled to said cell and effective, when energized, to cause said cell to decrease in electrical resistance from a high value to a low value;
- circuit means, including said cell, for controlling operation of a burner and an ignition means in response to said low resistance value and said high resistance value of said cell;
- a flame probe disposed in close proximity to said burner;
- a controlled solid-state switch connected in series with said lamp;
- gating circuit means for said switch, including said probe, for rendering said switch non-conductive in the presence of a current flow between said probe and said burner through a burner flame thus effecting de-energizing of

said lamp to effect said high resistance value of said cell, and for rendering said switch conductive in the absence of said current flow thus enabling energizing of said lamp to effect said low resistance value of said cell; and



means for reducing the rate and level of illumination of said lamp.

---

**4,370,126**

## COMBUSTION CONTROL APPARATUS

**Motoshi Miyanaka; Kenzi Toudo; Yoshinori Kudo, all of Yanai, and Sumio Nakagawa, Matudo, all of Japan, assignors to Hitaci, Ltd., Tokyo, Japan**

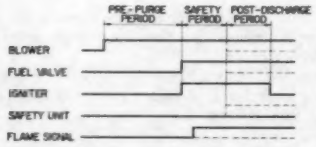
**PCT No. PCT/JP79/00231, § 371 Date May 5, 1980 § 102(e) Date May 5, 1980, PCT Pub. No. WO80/00609, PCT Pub. Date Apr. 3, 1980**

**PCT Filed Aug. 31, 1979, Ser. No. 197,775**

**Claims priority, application Japan, Sep. 11, 1978, 53-110773**

**Int. Cl.³ F23N *5/00***

**U.S. Cl. 431—73** **3 Claims**




1. A combustion control apparatus, including fuel supply drive means and igniter drive means for allowing a fuel supply and an ignition operation to be effected at least for a first predetermined period of time, said fuel supply being further continued, and said ignition operation being effected sequentially until termination of a second predetermined period of time subsequent to the first predetermined period of time, when ignition is attained within the first predetermined period of time, while said fuel supply and ignition operation being discontinued at termination of the first predetermined period of time, when ignition is not attained within the first predetermined period of time, said apparatus also including a first timer supplied with clock pulses for timing the first predetermined period of time and producing at the termination of the first predetermined period of time a signal indicating said discontinuation of the fuel supply and ignition operation when ignition is not attained within the first predetermined period of time, and a second timer supplied with clock pulses for timing the second predetermined period of time independently from the timing operation of said first timer, wherein said apparatus further comprises a first circuit generating a signal for cutting off a fuel valve in response to an output delivered from said second timer at the termination of the second predetermined period of time and a flame-absence signal applied through a flame signal input terminal and a second circuit for maintaining generation of said fuel valve cutting-off signal.

---

**4,370,127**

## APPARATUS FOR THE PRODUCTION OF CEMENT CLINKER LOW IN ALKALI FROM ALKALI-CONTAINING RAW MATERIAL

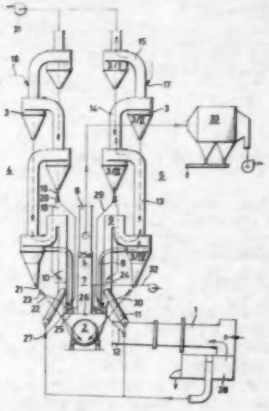
**Andris Abelitis, Rösrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany**

**Continuation of Ser. No. 89,626, Oct. 29, 1979, abandoned, which is a division of Ser. No. 888,757, Mar. 21, 1978, Pat. No. 4,211,573. This application Feb. 25, 1981, Ser. No. 237,973**

**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712239**

**Int. Cl.³ F27B *15/00, 7/02***

**U.S. Cl. 432—106** **5 Claims**



1. A device for production of low alkali cement clinker from alkali-containing raw material comprising:

at least one suspension gas cyclone pre-heater having a plurality of interconnected cyclones;

a calcining device having a heating means and having a gas conduit connecting said calcining device to said pre-heater;

a rotary kiln post-connected in the direction of material flow through said device to said cyclone preheater, said rotary kiln having an exhaust gas side;

a material cooler post-connected in the direction of material flow through said device to said rotary kiln, said rotary kiln and said calcining device via conduits with said material cooler on an exhaust side of said cooler;

a separate exhaust gas conduit connecting the exhaust gas side of said rotary kiln with said cyclone preheater;

a material off-take conduit for discharging material from said pre-heater, said material off-take conduit having at least a first branch conduit connected to a lower region of said separate exhaust gas conduit and a second branch conduit connected to a material intake side of said rotary kiln;

a means in said material off-take conduit for selectively adjusting the percentages of material from said pre-heater conveyed in said first and second branches;

a bypass conduit connecting said rotary kiln with the atmosphere; and

said separate exhaust gas conduit and said gas conduit of said calcining device being connected to the same cyclone of said plurality of cyclones in said gas cyclone pre-heater for utilizing substantially all exhaust gases from said rotary kiln for preheating said material in said same cyclone and

simultaneously maintaining a selected degree of calcining of said material.

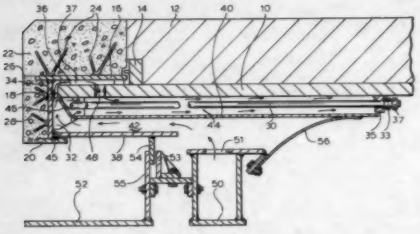
---

**4,370,128**

## PROTECTIVE DEVICE FOR A DISCHARGE END OF A TUBULAR ROTARY KILN

**Alain Chielens, Marc-en-Baroeul; Bernard Boussekey, Lille, and Bernard Deschamps, Villeneuve d'Ascq, all of France, assignors to Fives-Cail Babcock, Paris, France**

**Filed Nov. 12, 1981, Ser. No. 320,555**
**Claims priority, application France, Nov. 21, 1980, 80 24728**
**Int. Cl.³ F27B** *7/24, 7/38, 7/28*
**U.S. Cl. 432—115** **11 Claims**



**1.** A protective device for a discharge end of a tubular rotary kiln including a metal shell having an internal and external surface, the metal shell terminating in the discharge end, and the protective device comprising

(a) a flange extending radially outwardly of the rotary kiln shell and having a front face and a rear face,

(b) a metallic ring affixed to the flange and being arranged concentric with the metal shell at the discharge end, the metallic ring and the internal surface of the metal shell defining a space therebetween,

(c) a ring of refractory material supported by the metallic ring covering the metallic ring and the front face of the flange for protecting the internal surface of the shell at the discharge end and the front face of the flange, and

(d) means for cooling the rear face of the flange, the cooling means including

(1) two sleeves concentrically surrounding the external surface of the metal shell, an inner one of the sleeves defining an annular chamber with the external shell surface and an outer one of the sleeves defining another annular chamber with the inner sleeve,

(2) means for circulating cooling air through the annular chambers past the rear face of the flange, and

(3) the space between the metallic ring and the internal surface of the metal shell communicating with the outer annular chamber through a passage defined between the rear face of the flange and the discharge end of the metal shell, and with the inner annular chamber through a port in the metal shell spaced inwardly of the discharge end.

---

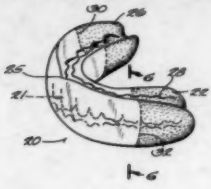
**4,370,129**

## TOOTH POSITIONER WITH HARDER AREAS

**Gerald W. Huge, Racine, Wis., assignor to Professional Positioners, Inc., Racine, Wis.**

**Filed Jun. 18, 1981, Ser. No. 275,002**
**Int. Cl.³ A61C** *7/00*
**U.S. Cl. 433—6** **7 Claims**

**1.** In tooth positioner means comprising an arch-shaped body of resilient material having an integrally formed tooth engaging proximal region and first and second integrally formed tooth engaging distal regions, said tooth positioner means being formed to fit within a patient's mouth between the upper and lower arches, such means having a generally concave surface for bearing on the buccal and labial surfaces of the teeth of at least one arch and having a convex surface adjacent to the lingual surface of the teeth, the improvement wherein at



least one of said proximal and distal regions of said arch-shaped body is an anchoring region composed of harder material than another of said proximal and distal regions.

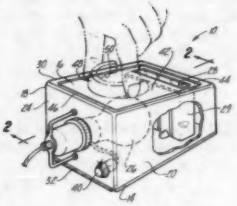
---

**4,370,130**

## WAX OCCLUSAL RIM WARMER

**Igor A. Berger, 25875 Greenfield, Southfield, Mich. 48075**

**Filed Jul. 1, 1981, Ser. No. 279,407**
**Int. Cl.³ A61C** *13/20*
**U.S. Cl. 433—32** **1 Claim**



**1.** Apparatus for removing material from a wax occlusal rim to establish the occlusal plane of the corresponding prosthodontic device comprising:

a body having side walls, a base adapted to be disposed on a supporting surface, and a planar top formed of metal, the top being supported on the side walls at an acute angle relative to the base;

a rectangular receptacle extending within the body and having an open upper end fixed to a slot formed in the top adjacent the edge thereof closest to the base;

an electric light bulb supported within the body with its bulb in proximity to the side of the top facing the base; and

means for energizing the light bulb to heat the planar top whereby a wax occlusal rim may be modified in form by pressing it into contact with the planar top, and wax melted from the rim will fall into said container.

---

**4,370,131**

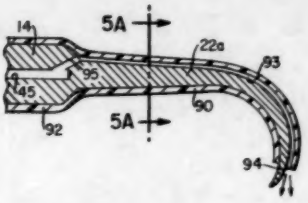
## ULTRASONIC TRANSDUCER TIPS

**Anton Banko, Bronx, N.Y., assignor to Surgical Design, Long Island City, N.Y.**

**Filed Jun. 24, 1977, Ser. No. 809,543**
**Int. Cl.³ A61C** *1/07*
**U.S. Cl. 433—86** **2 Claims**

**1.** An ultrasonic transducer comprising means for converting electrical energy into vibratory energy, acoustic impedance transformer means coupled to one end of said converting means, and a work tip having one end coupled to the other end of said acoustic impedance transformer means and a free end which vibrates upon receiving the vibratory energy from said converting means through said transformer means, means for supplying fluid to said transducer, and means for delivering

fluid from said supplying means to be discharged from an area of said tip, said delivering means comprising a sleeve conforming to the shape of and closely fully surrounding said tip along a substantial portion of its length, and at least one groove




formed in said work tip receiving fluid from said supplying means and forming a passage between said sleeve and said tip through which the fluid is discharged, the fluid being in contact with said tip along the length of said passage.

---

**4,370,132**

## ROTATABLE SOCKET FOR A DENTAL HANDPIECE

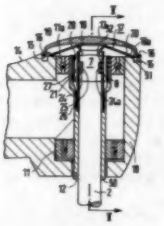
**Juergen Wohlgemuth, Darmstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Mar. 30, 1981, Ser. No. 248,863**

**Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012152**

**Int. Cl.³ A61C *1/14***

**U.S. Cl. 433—128** **15 Claims**



1. In a rotatable socket for supporting a tool for rotation in a head housing of a dental hand piece, said socket including a hollow cylindrical shaft having a bore for receiving a tool from one end and having a dog for engagement with a flattened surface on a shank of the tool for transmission of torque therebetween, said socket having a catch means comprising of at least one support element extending parallel to the axis of said hollow cylindrical shaft and having a catch nose extending radially inward for engagement in an annular groove in the shank of the tool disposed in said hollow cylindrical shaft, said catch means including means biasing said catch nose radially inward, said catch means including a thumb actuated purchase disposed on the head housing for releasing each of the catch noses upon actuation to allow disengagement of the tool from said socket, the improvements comprising the hollow cylindrical shaft containing an inner recess adjacent said bore for accepting the catch means, said recess receiving each support element and providing space adjacent the catch nose to enable radial outward movement of the catch nose to a position to enable disengagement of the catch nose from the tool, each support element being disposed in said recess with a free end being adjacent the other end of the shaft and a pressure element being disposed adjacent said other end of the shaft and in alignment with and disengaged from each free end, said purchase being mounted on the housing free of contact with all rotatable parts and adjacent the pressure element for relative movement so that when actuated the purchase urges the pressure element into engagement with each free end of the support element to urge each of the catch noses radially outward to a position to release a tool in said socket.

---

**4,370,133**

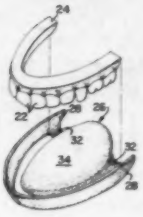
## DENTURE MEANS AND METHOD

**John A. Stempel, Chester, N.J., assignor to Cavitron Corporation, Palo Alto, Calif.**

**Filed May 14, 1974, Ser. No. 469,934**

**Int. Cl.³ A61C *13/22***

**U.S. Cl. 433—171** **8 Claims**




1. An assembly for forming a denture in the mouth of a dental patient comprising a tray having inner and outer walls made of formable material and approximating the shape of the patient's gums, a trough between said walls defining therewith a gum-receiving portion, a substantially U-shaped continuous slot formed in the bottom of said trough, said assembly further including a preformed unitary structure including prearranged individual artificial teeth and means for removably mounting said teeth in the slot of said tray, said mounting means including a preformed flange molded about the bases of said teeth to fixedly support said teeth in said preformed unitary structure, said flange extending beyond said slot onto said walls to support said teeth in said tray so that said teeth project through said slot.

---

**4,370,134**

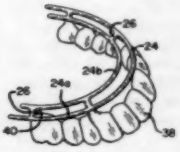
## ONE PIECE PERMANENT SUPPORT FRAME FOR UPPER DENTURES

**Harold D. Roberts, 1862 W. Broadway, Vancouver, B.C., Canada (V6J 1Y5)**

**Filed Dec. 3, 1980, Ser. No. 212,608**

**Int. Cl.³ A61C *8/00***

**U.S. Cl. 433—173** **3 Claims**




1. A permanent implant denture support frame arranged for association with the upper jaw of a person, comprising

(a) a frame portion consisting of first and second bar-like rails extending substantially in parallel relation,

(b) said rails being spaced from each other in selected parallel relation so as to allow said first rail to fit in a groove cut along the alveolar ridge and said second rail to fit in another groove cut in the jaw bone inwardly of the mouth relative to the alveolar ridge,

(c) cross webs securing said parallel rails together at spaced points throughout the length of said frame portion,

(d) and artificial denture means depending integrally from said frame portion,

(e) said frame being shaped similar to the contour of the upper jaw of a person so that said rails are arranged to fit in the respective grooves.

---

**4,370,135**

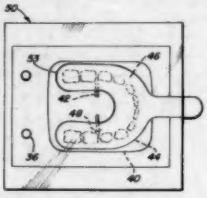
## METHOD AND APPARATUS FOR MAKING DENTAL STUDY MODELS

**James R. Powell, 855 Hoffman St., Elmira, N.Y. 14905**

**Filed Oct. 31, 1980, Ser. No. 203,386**

**Int. Cl.³ A61C *11/00***

**U.S. Cl. 433—213** **10 Claims**



1. In a method of making upper and lower dental study models adapted to be positioned in occlusion with each other by contact with a wax bite, and wherein said models are independently cast between respective impression holding trays and a common former having a base molding cavity dimensioned for minimal trimming of the base portions of the study models, the steps of: initially casting one of the study models in the common former; positioning one of the impression holding trays, corresponding to the other of the study models to be subsequently cast, over the initially cast study model in an aligned position; recording the aligned position of said one of the trays on an alignment guide; removing the initially cast study model from the common former; and then casting said other of the study models between said common former and said one of the trays while holding thereof in alignment with the recorded position on the alignment guide.

---

**4,370,136**

## TREATMENT FOR PERIODONTAL DISEASES

**Lawrence E. Widman, 315 W. Glenside Ave., Glenside, Pa. 19038; Nasser G. Habeeb, 257 Albany Ave., Kingston, N.Y. 12401, and Raymond Z. Darakjian, 531 Summit St., Englewood Cliffs, N.J. 07632**

**Continuation-in-part of Ser. No. 882,941, Mar. 2, 1978, abandoned. This application May 1, 1981, Ser. No. 259,583**

**Int. Cl.³ A61K *6/08***

**U.S. Cl. 433—217** **5 Claims**

1. A method for treating the resorption of bone from around the root surfaces of periodontally involved natural teeth which comprises coating said surfaces with a nontoxic, biocompatible composition containing a polycarbonate resin dissolved in a nontoxic organic solvent and which is capable of supporting biological attachment of gingival cells and is impermeable to bacterial toxins.

---

**4,370,137**

## COIFFURE DEMONSTRATION HEAD MODEL

**Heinrich G. Herzig, Schwetzingen, and Robert Rothfuss, Fellbach, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany**

**Filed Jul. 24, 1981, Ser. No. 286,548**

**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1980, 3032860**

**Int. Cl.³ G09B *25/00***

**U.S. Cl. 434—94** **14 Claims**

1. A demonstration head model for coiffures, comprising a body having a hair-indicating surface, an adhering means extending over said surface and engaged therewith, said hair-indicating surface having a middle line, said adhering means being arranged in rows of strips, two rows of said strips extending transverse of said middle line and away therefrom, at least a number of said rows extending along a lower edge of said

hair-indicating surface and in a circumferential direction approximately corresponding to the circumference of the head model; and a plurality of pattern elements corresponding to hair locks to be cut and/or set, said pattern elements including pad-like projections which engage with said strips to thereby secure said pattern elements on said head model body.

---

**4,370,138**

## INSTALLATION FOR SUPPORTING A BOAT ENGINE INSTALLED INBOARD AT A TRANSOM PLATE

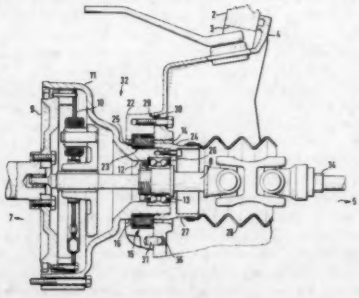
**Josef Wilka, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany**

**Filed Jun. 30, 1978, Ser. No. 920,696**

**Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2729963**

**Int. Cl.³ B63H *1/14***

**U.S. Cl. 440—112** **11 Claims**



1. An installation for the support of an inboard engine at a transom plate connected with a boat transom for an outboard drive means, comprising neck means secured at the boat engine and receiving a connecting shaft between the boat engine and the drive means, said neck means being inserted into an aperture of the transom plate, and elastic means surrounding said neck means operatively connecting the latter with the aperture in the transom plate, said elastic means being retained at the

neck means by an axial clamping-in action in its inner circumferential area, characterized in that the elastic means is retained at the transom plate by an axial clamping-in action in its outer circumferential area, and in that a radially and axially yielding section free of clamping means is provided between the two clamping areas and wherein said elastic means includes in both clamping areas a pressure-resistant means limiting the deformation of the elastic means by the axial clamping-in action, the pressure-resistant means in each clamping area including a plurality of inserts which are spaced axially with respect to one another.

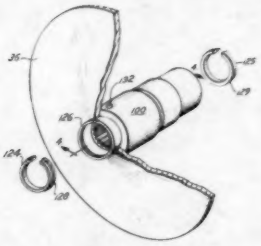
---

**4,370,139**

## VARIABLE SPEED V-BELT SHEAVES

**James D. Zigler, Columbus, Ind., assignor to Reliance Electric Company, Columbus, Ind.**

**Filed Oct. 15, 1979, Ser. No. 84,729**
**Int. Cl.³ F16H** *55/56*
**U.S. Cl. 474—45** **9 Claims**



1. A variable speed V-belt sheave, comprising a rotatable shaft with an axial bore, a radial hole connected to said bore, and an annular groove in the surface of said shaft communicating with said hole, a pair of flanges, a hub with an internal wall defining a bore therethrough for one of said flanges mounted on said shaft and slidable axially thereon, complementary key-ways disposed axially in said shaft and hub, a key disposed in said key-ways for interlocking said shaft and hub against relative rotation therebetween while permitting axial movement therebetween, means defining a plurality of spaced, axially disposed lubrication grooves in the internal wall of said hub communicating with said annular groove, and means defining an annular lubrication groove in said internal wall of the hub near one end thereof interconnecting said axially disposed grooves for relieving excess lubricant in said axially disposed grooves.

---

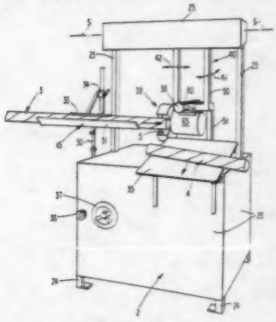
**4,370,140**

## PAPER TUBE CUT OFF SAW

**Richard F. Fegley, Warrington, and Steven R. Kiss, Fort Washington, both of Pa., assignors to Paco Winders, Inc., Philadelphia, Pa.**

**Division of Ser. No. 24,507, Mar. 28, 1979, Pat. No. 4,258,613. This application Jan. 12, 1981, Ser. No. 224,153**
**Int. Cl.³ B26D** *1/60*
**U.S. Cl. 493—289** **3 Claims**

1. In an orbital saw for cutting paper tubes:
upright frame means;
a horizontally extending main slide shaft fixed adjacent the top of said frame means;
an upright saw blade frame including an upper part and a lower part each constructed of substantially square tubing and said parts being laterally off-set a distance substantially the same as the width of a tube;
means at the lower end of said saw blade frame for releasably maintaining a cam roller stud;
a pair of re-circulating bearing means mounted on said slide shaft and secured adjacent the top of said saw blade-frame and providing for the saw blade frame to reciprocate and to swing on the slide shaft;
guide means comprising a pair of spaced apart rods connected to said saw blade frame and extending parallel one another in a direction transverse the axis of said slide shaft;
a saw blade motor mounting plate;
bearing means connecting the saw motor mounting plate to said guide means for reciprocating motion along the guide means;
a saw blade motor mounted on said plate for movement therewith and a saw blade mounted on the motor to be rotated thereby;
nut means mounted on said saw blade frame;



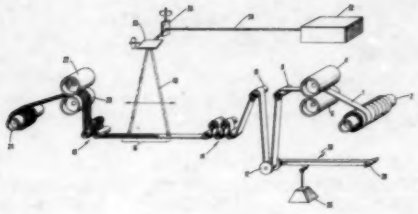
control means including first and second relatively movable elements, the first element being fixedly connected to said saw blade motor mounting plate for causing movement of same and the axis of relative motion between the elements being parallel to said rods and equidistant therefrom;
an adjusting screw mounted in said nut means for movement back and forth therein and being disposed generally coaxial with said axis of relative motion between the elements, one end of the screw being connected to said second element for moving the same;
means operative to move said first element to a cutting position wherein it is immovable with respect to the second element whereby motion of the adjusting screw causes said first element and said saw blade mounting plate to move relative to said saw blade frame, the cutting position being for use in setting and maintaining the saw blade in condition for engaging and cutting a tube and said means to move being further operative to move said first element and mounting plate to a non-cut position wherein the first element and mounting plate are immovable with respect to the blade saw frame, the non-cut position being for use in setting and maintaining the saw blade in condition whereby the blade cannot engage and cut a tube.

4,370,141

## PROCESS FOR THE THERMAL STABILIZATION OF ACRYLIC FIBERS

Shu M. Lee, Madison, N.J., and Donald M. Gezovich, Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,741
Int. Cl.³ C01B 31/07
U.S. Cl. 8—115.5 21 Claims



1. In a process for the thermal stabilization of an acrylic fibrous material selected from the group consisting of an acrylonitrile homopolymer and an acrylonitrile copolymer containing at least 85 mole percent acrylonitrile units and up to 15 mole percent of one or more monovinyl units copolymerized therewith wherein said acrylic fibrous material is heated in an oxygen-containing atmosphere while retaining the original fibrous configuration substantially intact and said acrylic fibrous material is rendered black in appearance and non-burning when subjected to an ordinary match flame; the improvement of accomplishing at least a portion of the heating of said acrylic fibrous material by the intermittent irradiation of said acrylic fibrous material with a laser beam.

---

4,370,142

## HAIR-DYEING COMPOSITIONS BASED ON PARA-PHENYLENEDIAMINE AND ORTHO-AMINOPHENOL

Andree Bugaut, Boulogne-Billancourt; Philippe Thouvenin, Aulnay-sous-Bois, and Jean Cotteret, Franconville, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 8, 1980, Ser. No. 167,149
Claims priority, application France, Jul. 10, 1979, 79 17889
Int. Cl.³ A61K 7/13
U.S. Cl. 8—407 12 Claims

1. A composition suitable for dyeing human hair which contains, in a cosmetically acceptable medium, paraphenylenediamine, or a cosmetically acceptable salt thereof, and orthoaminophenol, or a cosmetically acceptable salt thereof, in a molar ratio para-phenylenediamine/orthoaminophenol which is less than or equal to 2:1 in the case para-phenylenediamine is present in an amount of 1 to 2.5% by weight and which is greater than or equal to 1:1 and less than or equal to 3:1 in the case para-phenylenediamine is present in an amount of 0.2 to 1% by weight.

4. A composition according to claim 1 which additionally contains at least one direct dyestuff.

8. Process for dyeing the hair which comprises mixing a composition as defined in claim 1 with an oxidising agent which is hydrogen peroxide or urea peroxide, and applying the resulting mixture to the hair for 10 to 30 minutes.

---

4,370,143

## PROCESS FOR TREATMENT OF POLYESTER FABRICS

Jackson Bauer, Croydon, Pa., assignor to Collins and Aikman Corp., New York, N.Y.

Filed Mar. 12, 1981, Ser. No. 243,249
Int. Cl.³ D06M 1/02; D06P 5/22
U.S. Cl. 8—493 14 Claims

1. A process for imparting improved soil-release, moisture-wicking, soil-redeposition, and anti-static properties to a polyester fabric, comprising the steps of:

immersing the polyester fabric in an alkaline bath,

adjusting the pH of the alkaline bath to a value of 5.5 or less, and

adding to said bath a polyester copolymer, said copolymer comprising an aqueous dispersion of 10–50% by weight ethylene terephthalate units, 50–90% by weight polyoxyethylene terephthalate units, wherein the average molecular weight of the polyoxyethylene units is 1000–4000, wherein the molar ratio of ethylene terephthalate to polyoxyethylene terephthalate is in the range of 2:1 to 6:1, wherein the viscosity ratio of the copolymer is between 1:10 and 1.50, and wherein the melting point of the copolymer is above 100° C. as measured by the temperature of disappearance of birefringence.

---

4,370,144

## TWO-PHASE ORGANIC SOLVENT-WATER DYEING PROCESS FOR POLYESTER FIBERS

James K. Skelly, Wilmslow; David G. Evans, Bamford, both of England, and Carl Becker, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 955,683, Oct. 30, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 117,940
Claims priority, application United Kingdom, Nov. 10, 1977, 46793/77
Int. Cl.³ D06P 5/00
U.S. Cl. 8—501 22 Claims

1. A process for dyeing polyester fibers comprising the steps of contacting the fibers with a two-phase system comprising (A) an organic solvent chosen from the group consisting of phenoxyethanol, phenxypropanol and benzyl alcohol and (B) water, in a weight ratio of about 1:25, said organic solvent containing a disperse dye dissolved therein, which dye is introduced into the two-phase system in the form of an aqueous, stable, highly concentrated, finely dispersed, flowable preparation having a low content of dispersing agent and a particle size of the dyestuff particles smaller than 10 microns, said preparation containing at least 10% by weight of water, at least 25% by weight of dyestuff, at most 10% by weight of an anionic dispersing agent, at most 5% by weight of a non-ionic dispersing agent and at most 35% by weight of a hydrotropic agent, at a temperature of about 100° C. and subsequently removing the organic phase from the system to fix the dye, the entire process being carried out at a temperature of about 100° C.

---

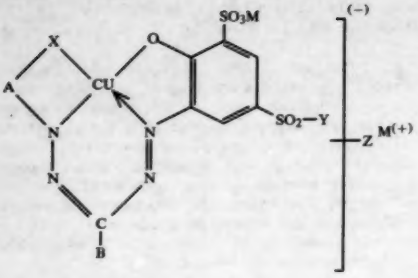
4,370,145

## COPPER FORMAZAN COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS DYESTUFFS

Günther Schwaiger, and Ernst Hoyer, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 204,916, Nov. 7, 1980, abandoned. This application Nov. 25, 1981, Ser. No. 324,871
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1979, 2945464; Sep. 20, 1980, 3035562
Int. Cl.³ C09B 62/50, 50/00
U.S. Cl. 8—549 4 Claims

1. A copper formazan compound of formula (1):



(1)

in which:

Z is a water-solubilizing group and a substituent on A and B or both, being imperatively present in the formazan molecule once, twice or three-times and being bonded to an aromatic carbon atom or an aliphatic carbon atom of A or B;

A is phenylene or naphthylene unsubstituted or substituted by substituents selected from the group consisting of halogen, nitro, alkyl of from 1 to 5 C-atoms, alkoxy of from 1 to 4 C-atoms, alkylsulfonyl of from 1 to 4 C-atoms, phenylsulfonyl, sulfamoyl and N-mono- and N,N-dialkylsulfamoyl with 1 to 4 C-atoms in each alkyl, and optionally substituted by Z as indicated above; B is a straight-chain or branched-chain alkyl group of from 1 to 8 C-atoms or a straight-chain or branched-chain alkenyl group of from 2 to 8 C-atoms, these alkyl and alkenyl groups are unsubstituted or substituted by phenyl or by phenyl substituted by substituents selected from the group consisting of methyl, ethyl, methoxy, ethoxy, fluorine, chlorine, bromine and sulfamoyl, or B is phenyl or naphthyl each unsubstituted or substituted by substituents selected from the group consisting of hydroxy, nitro, halogen, alkyl of from 1 to 5 C-atoms, alkoxy of from 1 to 4 C-atoms and carbalkoxy of from 2 to 5 C-atoms, or

B is the monovalent radical of furan, thiophene, pyrrole, imidazole, indole, pyrazole, pyridine, pyrimidine, quinoline or benzimidazole, these heterocyclic radicals are unsubstituted or substituted on an aromatic carbon atom by chlorine, phenyl, methoxy, ethoxy, methyl or ethyl, and the hydrogen atoms in the NH groups of these heterocyclic rings may be replaced by methyl, ethyl or benzyl, and

B is optionally substituted by Z as indicated above, or B is a hydrogen atom;

Cu is copper,

X is oxygen or carbonyloxy of the formula —CO—O—, each bonded to A in the ortho-position relative to the nitrogen atom on A,

Y is vinyl or β-thiosulfatoethyl, and

M is hydrogen or an equivalent of a metal.

---

**4,370,146**

## INFRARED ABSORPTION DETERMINATION OF SULFONATE SURFACTANTS UTILIZING DEUTERATED SULFONATES

**Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 16, 1981, Ser. No. 331,056**

**Int. Cl.³ G01N *21/35*; E21B *47/00, 49/08***

**U.S. Cl. 436—120** **2 Claims**

1. A method for determining the concentration of a brine tolerant sulfonate surfactant in a complex mixture containing, in addition to said brine tolerant sulfonate surfactant, lignosulfonates, crude oil, salts, and water and, optionally, petroleum sulfonates and alcohols, that comprises incorporating into the brine tolerant sulfonate surfactant molecule a small amount of deuterium prior to addition to the complex mixture and determining the concentration of the brine tolerant sulfonate surfactant by measuring its absorption of infrared light at about 2150 $cm^{-1}$.

---

**4,370,147**

## FUEL FOR COMPRESSION IGNITION ENGINES

**Thomas C. Kenny, Syosset, and John P. Plunkett, Smithtown, both of N.Y., assignors to Horizon Chemical, Inc., Freeport, N.Y.**

**Filed Oct. 1, 1979, Ser. No. 81,016**

**Int. Cl.³ C10L *1/18, 1/22, 1/30***

**U.S. Cl. 44—68** **16 Claims**

1. A fuel for a compression ignition engine containing from about $1.0\times10^{-6}$ to about $1.0\times10^{-3}$ parts by weight of at least one isomer of dinitrotoluene.

---

**4,370,148**

## CHLOROFLUOROFERRATE(II,III), A PROCESS FOR ITS MANUFACTURE, ITS USE AND A GRINDING WHEEL CONTAINING CHLOROFLUOROFERRATE(II,III)

**Rudolf Hirschberg, and Bernd Schönfeld, both of Bad Nenndorf, Fed. Rep. of Germany, assignors to Riedel-De Haen Aktiengesellschaft, Seelze/Hanover, Fed. Rep. of Germany**

**Filed Jul. 9, 1981, Ser. No. 281,845**

**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026294**

**Int. Cl.³ C09C *1/02*; C01G *49/00***

**U.S. Cl. 51—293** **8 Claims**

1. A chlorofluoroferrate(II,III) of the formula (1)

$$A_xFeCl_yF_z \quad (1)$$

in which A is an alkali metal ion or an ammonium ion, x is a number from 1 to 10, y is a figure from 0.1 to 12.9, z is a figure from 0.1 to 12.9 and the total of y+z is at least 3.

3. A grinding wheel comprising an abrasive material, a binder and, as filler, a chlorofluoroferrate (II,III) of the formula

$$A_xFeCl_yF_z$$

in which A is an alkali metal ion or an ammonium ion, x is a number from 1 to 10, y is a figure from 0.1 to 12.9, z is a figure from 0.1 to 12.9 and the total of y+z is at least 3.

---

**4,370,149**

## DIAMOND COMPACT FOR A WIRE DRAWING DIE AND A PROCESS FOR THE PRODUCTION OF THE SAME

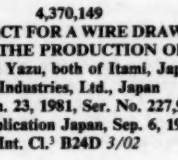
**Akio Hara, and Shuji Yazu, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan**

**Filed Jan. 23, 1981, Ser. No. 227,971**

**Claims priority, application Japan, Sep. 6, 1980, 55-123868**

**Int. Cl.³ B24D *3/02***

**U.S. Cl. 51—309** **10 Claims**




1. A diamond compact for a wire drawing die, which comprises 70 to 95% by volume of diamond powder with a particle size of at most 50 microns and the balance of a binder phase consisting of a carbide of WC or (Mo, W)C with a particle size of at most 1 micron and an iron group metal, the carbide and

iron group metal in the binder phase being in such a proportion by weight that the content of the carbide is more than that corresponding to the eutectic composition.

---

**4,370,150**

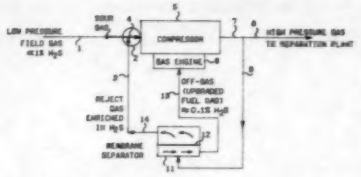
## ENGINE PERFORMANCE OPERATING ON FIELD GAS AS ENGINE FUEL

**Roger W. Fenstermaker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Continuation-in-part of Ser. No. 180,172, Aug. 21, 1980, abandoned. This application Aug. 11, 1981, Ser. No. 292,102**

**Int. Cl.³ B01D** *53/32*

**U.S. Cl. 55—16** **9 Claims**




**1.** A method of protecting a natural-gas-utilizing engine from corrosion and knock which comprises the steps of:

treating a portion of a high pressure field gas stream containing primarily methane in admixture with hydrogen sulfide and/or higher hydrocarbons with a permeable membrane, wherein said membrane is relatively more permeable to said hydrogen sulfide and said higher hydrocarbons, thereby producing a reject gas stream enriched in hydrogen sulfide and/or higher hydrocarbons, and an off-gas useful as an upgraded fuel gas stream relatively depleted in hydrogen sulfide and/or higher hydrocarbons,

reinjecting said reject gas stream to said low pressure field gas, and

operating said gas-utilizing engine on said upgraded fuel gas.

---

**4,370,151**

## PROCESS AND APPARATUS FOR GASSING LIQUIDS

**Peter Herbrechtsmeier, Hofheim am Taunus; Hans Schäfer, Bad Soden am Taunus, and Rudolf Steiner, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 24, 1981, Ser. No. 247,133**

**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011613**

**Int. Cl.³ B01F** *3/04;* **B01D** *19/00*

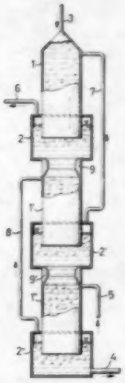
**U.S. Cl. 55—38** **7 Claims**

**1.** A multistep process for contacting a liquid with a gas, the liquid streaming vertically downward in a gassing apparatus, said gassing apparatus comprising at least two superposed downstream parts, with the liquid passing downward through a constriction joining the lower end and the upper end of successive such superposed downstream parts, wherein the gas is fed in at the upper end of each downstream part and fresh gas is fed in exclusively at the upper end of the lowest downstream part, gas bubbles are separated at the lower end of each downstream part by reducing the velocity of the liquid flow in adequate manner between two adjacent downstream parts and at the lower end of the lowest downstream part, the separated gas bubbles are discharged to the outside and recycled to the next downstream part above, wherein the speed of the liquid stream immediately after gas bubble separation is increased vertically downward at said constriction before feeding in further gas in such manner that backmixture of bubbles between the immediately subsequent downstream parts is prevented.

**3.** A process for gassing a liquid which comprises passing a continuous stream of liquid vertically downward and successively through multiple stages, each stage having an upper portion of minimum cross-section, an intermediate portion of intermediate cross-section and a lower portion of maximum cross-section whereby the velocity of the stream of liquid is correspondingly reduced stepwise from a maximum to a minimum velocity as it moves successively through the upper, intermediate and lower portions of each stage and is increased again to its maximum velocity as it passes vertically downward through a constriction joining the lower portion of each stage with the upper portion of the next successive stage;

introducing a continuous stream of gas into the stream of liquid in the upper part of the intermediate portion of a lower stage;

collecting non-absorbed bubbles of gas in the lower portion of said lower stage;



reintroducing a continuous stream of gas from said non-absorbed bubbles into the stream of liquid in the upper part of the intermediate portion of the next higher stage;

collecting non-absorbed bubbles of gas in the lower portion of said next higher stage; and

adjusting the flow velocity of the stream of liquid so that it exceeds the speed of the bubbles through the stream in the upper portion of each stage, whereby said bubbles are moved downwardly with the stream of liquid within the intermediate portions of each stage, are permitted to move upwardly against the stream of liquid within the lower portions of each stage and are positively prevented from rising from each area of entry into the lower portion of the next upper stage by the maximum downward velocity of the liquid in the upper portion of the stage into which the gas is introduced.

---

**4,370,152**

## GAS DRYER CARTRIDGE

**Charles R. Luper, Anaheim, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Jun. 29, 1981, Ser. No. 278,777**

**Int. Cl.³ B01D** *53/26*

**U.S. Cl. 55—281** **3 Claims**

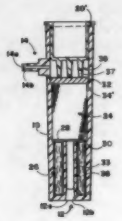
**1.** A dryer cartridge for removing moisture from a gas stream including, in combination:

(a) a generally tubular housing having an upper end and a lower end, said housing being partitioned into an upper, gas drying chamber and a lower, liquid collecting chamber,

(b) an inlet tube extending from the lower end of the housing, through the liquid collecting chamber, to provide a path for the flow of gas from the exterior of the housing to the gas drying chamber, the space between the tube and the housing defining the liquid collecting chamber,

(c) an outlet extending from the gas drying chamber to the exterior of the housing,

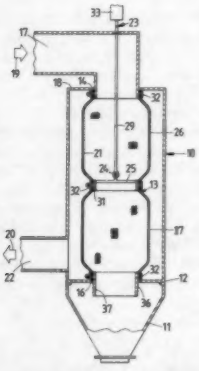
(d) upper and lower retaining members for retaining a dessicant material within the gas drying chamber while permitting gas to flow therethrough,
(e) an end cap closing the upper end of the housing, said end cap serving to maintain the upper retaining member in contact with the dessicant material,



(f) a liquid retaining element in the liquid collecting chamber,
(g) the volume of the liquid collecting chamber being sufficient to contain the liquid produced as a result of the liquefaction of the dessicant material.

---

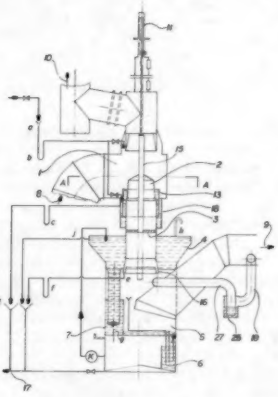
**4,370,153**
**APPARATUS FOR CLEANING FILTER BAGS**
**Benjamin Russell, and Jerry W. Scott, both of Alexander City, Ala., assignors to Econ Company, Alexander City, Ala.**
**Filed Nov. 12, 1981, Ser. No. 320,466**
**Int. Cl.³ B01D *46/04***
**U.S. Cl. 55—304** **7 Claims**



1. Apparatus for filtering entrained particulate matter from a gaseous fluid comprising:
(a) an upstanding housing having discharge means adjacent the lower end thereof for removing particulate matter,
(b) at least one upstanding porous tubular filter bag mounted within said housing with the ends of said filter bag being attached to said housing and with the length of said bag being greater than the distance between the points of attachment of said ends to said housing,
(c) means for introducing said gaseous fluid with particulate matter entrained therein into one end of said filter bag so that said particulate matter is deposited on the inner surface of said filter bag,
(d) an outlet communicating with said housing for discharging said clean gaseous fluid,
(e) a reciprocating drive means, and
(f) actuator means operatively connected to said reciprocating drive means and to said filter bag intermediate the ends thereof to impart longitudinal reciprocatory movement to the filter bag selectively in a first direction to relax the upper portion of said filter bag and extend the lower portion thereof to dislodge particulate matter therefrom and in a second direction to relax the lower portion of said filter bag and extend the upper portion thereof to dislodge particulate matter therefrom.

---

**4,370,154**
**GAS DIVERSION UNIT**
**Gerald Namy, Saint-Etienne, and Jean Cordier, Dunkerque, both of France, assignors to Creusot-Loire Entreprises, Courbevoie and Usinor, Paris, both of, France**
**Filed May 22, 1980, Ser. No. 152,141**
**Claims priority, application France, Jun. 7, 1979, 79-14583**
**Int. Cl.³ B01D *46/00***
**U.S. Cl. 55—309** **5 Claims**



1. A gas diversion unit comprising
(a) a vertical axis generally cylindrical housing having upper and lower outlets;
(b) a gas feed inlet horizontally connected to said housing;
(c) a bell movable between said upper and lower outlets; and
(d) steel lip-water trough gas seals formed between said bell and said housing when said bell is at its uppermost or lowermost position;
(e) waste gases being directed to a stack open to the atmosphere when said bell is at one of its extreme positions and to a processing network duct when said bell is at the other of its extreme positions; and
(f) the inlet and housing connection being in the form of a cyclone, for separating out water droplets and dust contained in the waste gases.

---

**4,370,155**
**AIR CIRCULATING DEVICE**
**Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064**
**Filed Nov. 4, 1980, Ser. No. 204,072**
**Int. Cl.³ B01D *50/00*; F24F *13/06***
**U.S. Cl. 55—316** **13 Claims**

1. An air circulating device for providing circulation of air throughout substantially the total area of a room, comprising: a hollow base forming the bottom portion of said device and capable of supporting said device adjacent to the floor of a room, an air inlet means formed in said base and capable of receiving air flowing parallel and adjacent to the floor, a single blower assembly contained within said base and including an impeller enclosed within a blower housing, said blower housing including a blower outlet, a casing comprising an elongated

vertical air chamber disposed over said hollow base, first and second elongated vertical air outlets placed in said casing and positioned and arranged on opposite sides of said casing so as to provide at least two divergent substantially horizontal air-

flow paths, said blower outlet being orientated upwardly into said air chamber and being contiguous therewith, whereby forced air is discharged from said air chamber into said at least two divergent substantially horizontal paths directly from said air outlets into a room.

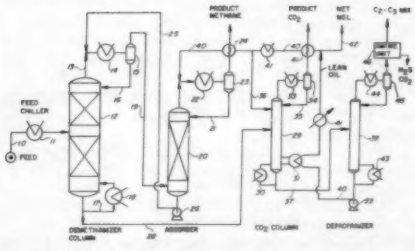
---

**4,370,156**

## PROCESS FOR SEPARATING RELATIVELY PURE FRACTIONS OF METHANE AND CARBON DIOXIDE FROM GAS MIXTURES

**Clifton S. Goddin, Jr., Tulsa, and Russell L. McGalliard, Broken Arrow, both of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed May 29, 1981, Ser. No. 268,832**
**Int. Cl.³ F25J 3/02**
**U.S. Cl. 62—17** **5 Claims**



1. A cryogenic process for separating relatively pure fractions of methane and carbon dioxide from a mixture thereof containing at least about twenty mol percent (20%) carbon dioxide and at least about five mol percent (5%) methane and which also contains other components including ethane and higher hydrocarbons and hydrogen sulfide, said process comprising:

(a) Cooling said mixture to a temperature of between about zero° F. and minus 40° F. and introducing said mixture into a demethanizer distillation column maintained at a pressure of between about 450 and about 650 psia;

(b) taking an overhead distillate stream from said column comprising methane and at least about ten mol percent carbon dioxide and absorbing said carbon dioxide from said overhead stream by contacting it with a lean oil absorbent to produce sweet product methane containing less than two mol percent carbon dioxide;

(c) withdrawing a bottoms stream comprising carbon dioxide, ethane and higher hydrocarbons and hydrogen sulfide from said column and introducing said bottoms stream into a carbon dioxide separation column maintained at a pressure of between about 400 and about 500 psia;

(d) also introducing into said carbon dioxide column a stream of lean oil in sufficient amount to enhance the volatility of carbon dioxide relative to hydrogen sulfide and thereby produce a sweet high purity product carbon dioxide overhead stream;

(e) withdrawing from the bottom of said carbon dioxide column a bottoms stream comprising hydrogen sulfide, ethane and higher hydrocarbons;

(f) separating said lean oil from said bottoms stream to provide the lean oil requirements for the carbon dioxide absorption step set forth in (b) above and for introduction into said carbon dioxide column as is set forth in (d) above.

5. A cryogenic process for separating relatively pure fractions of methane and carbon dioxide from mixtures thereof which also contain other components, including ethane and higher hydrocarbons and hydrogen sulfide, said process comprising:

(a) cooling said methane carbon dioxide mixture comprising at least about twenty mol percent (20%) carbon dioxide and at least about five mol percent (5%) methane to a temperature of between about minus 10° F. and minus 40° F. and introducing the mixture at an intermediate level into a demethanizer distillation column maintained at a pressure of between about 450 and 650 psia;

(b) maintaining the top of said column at a temperature of between about minus 20° F. and minus 60° F. by refluxing of condensed vapors withdrawn from the top of said column, the bottom of said column being maintained at a temperature of between about 50° F. to 120° F. by a reboiler which provides a stripping vapor for the column;

(c) introducing the bottoms stream into a carbon dioxide column at an intermediate level, the carbon dioxide column being provided with external reflux means at its upper end and reboiler means at its lower end whereby purified carbon dioxide product is withdrawn from the top of said carbon dioxide column and a bottoms stream comprising ethane and higher hydrocarbons and hydrogen sulfide is withdrawn at the bottom;

(d) depropanizing the withdrawn bottoms stream from the carbon dioxide column by fractionation to separate hydrogen sulfide and $C_3$'s from lean oil; and

(e) recycling the lean oil fraction to an upper region of either or both of the columns to permit operating at temperatures high enough to prevent the formation of solid carbon dioxide in the methane separation step and to increase the volatility of carbon dioxide relative to hydrogen sulfide in the case of the carbon dioxide column.

---

**4,370,157**

## STABLE SIZING COMPOSITIONS USED DURING FORMING OF GLASS FIBERS AND RESULTING FIBER

**Herbert W. Barch, Natrona Heights; Carl A. Melle, Gibsonia; Donald E. McWilliams, Pittsburgh, and Howard J. Hudson, Braddock, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation of Ser. No. 242,098, Mar. 9, 1981, abandoned, which is a division of Ser. No. 22,674, Mar. 22, 1979, abandoned. This application Dec. 29, 1981, Ser. No. 335,440**
**Int. Cl.³ C03C 25/02**
**U.S. Cl. 65—3.43** **4 Claims**

2. A method of forming glass fibers comprising:

forming glass fibers from molten cones of glass at the tips of orifices in a bushing by attenuation;

sizing said glass fibers with an aqueous sizing composition, comprising:

about 5 to about 15 weight percent of a unsaturated water insoluble polyester resin;

about 0.5 to about 1.5 weight percent of a plasticizer;

about 0.1 to about 1.0 weight percent of a methacryloxyalkyltrialkoxy silane to promote adhesion between said glass fibers and resinous material;

an acid base salt reaction product formed from about 0.1 to about 1.0 percent by weight of amino-containing silane coupling agent and a water solubilizable condensation, crosslinkable, ethylenically unsaturated polyester resin having free carboxyl groups in an amount of about 5 to 15 weight percent of the aqueous sizing composition, where the polyester resin having free carboxyl groups and amino silane are combined to favor the reaction between the free carboxyl groups of the polyester and the amine groups of the silane over the formation of silane dimers by combination of hydrolyzed silanes;

about 2 to about 7 weight percent by weight of an acrylic thermoplastic polymer being of sufficient low molecular weight to impart pressure sensitive adhesive characteristics to said sizing composition; and

an amount of water to give a sizing composition containing an amount of total solids in the range of about 18 percent to about 40 weight percent; and

gathering said fibers into strands; and

collecting said glass fiber strands.

---

## 4,370,158
## HEAT-TREATING METHOD FOR SEMICONDUCTOR COMPONENTS

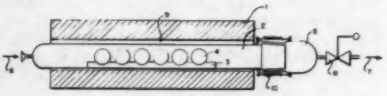
**Karl A. Schülke, Neuberg, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany**

**Continuation of Ser. No. 77,509, Sep. 20, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,564**

**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843261**

**Int. Cl.³ C03B *32/00***

**U.S. Cl. 65—32** **3 Claims**



1. A method of heat-treating, at temperatures above 1200° C., semiconductor components which are introduced into a quartz-glass tube, a gas stream being conducted through the quartz-glass tube, wherein there is maintained in the interior of the quartz-glass tube, at least for the length of time that the temperature of 1200° C. is exceeded, a pressure which is from 3 to 110 mm Hg higher than the pressure on the external surface of the quartz-glass tube over the heated area of the tube.

---

## 4,370,159
## NUTRIENT FOR MUSHROOM GROWTH AND PROCESS FOR PRODUCING SAME

**R. Barry Holtz, Los Gatos, Calif., assignor to Spawn Mate, Inc., San Jose, Calif.**

**Filed Apr. 6, 1981, Ser. No. 251,108**

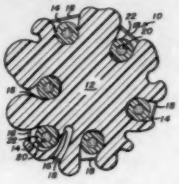
**Int. Cl.³ C05F *11/00***

**U.S. Cl. 71—5** **9 Claims**

1. An improved nutrient for fungus growth, in particle form, comprising:

a matrix particle of anhydrous denatured protein material; and

a plurality of growth enhancer droplets smaller in size relative to the matrix particle and having a core of fungus growth stimulating materials microencapsulated by an activated protein outer shell, said droplets being attached to the matrix particle such that the droplets are available only to those mycelia having sufficient maturity and vitality to break down and utilize the protein of the matrix particle.



---

## 4,370,160
## PROCESS FOR PREPARING SILICONE MICROPARTICLES

**Maris J. Ziemelis, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.**

**Filed Jun. 27, 1978, Ser. No. 919,588**

**Int. Cl.³ A01N *37/38*; B01J *13/02*; B05D *3/06*; C08F *30/08***

**U.S. Cl. 71—117** **14 Claims**

2. A process for preparing microcapsules consisting essentially of an internal material dispersed throughout a solid organopolysiloxane, said process comprising

(I) preparing a dispersion of discrete entities in a fluid continuous phase by dispersing or dissolving the internal material in a liquid organopolysiloxane composition, convertible by ultraviolet radiation to the solid state, and dispersing the resulting dispersion or solution in the continuous phase fluid, said fluid continuous phase being transparent to ultraviolet radiation and said liquid organopolysiloxane composition being insoluble in the fluid continuous phase and consisting essentially of

(a) an organopolysiloxane wherein an average of at least two of the organic radicals per molecule are silicon-bonded olefinic radicals selected from the group consisting of vinyl and butenylene and

(b) a hydrogen-containing organopolysiloxane, free of aliphatic unsaturation, wherein the average molecule contains at least two hydrogen radicals selected from the group consisting of silicon-bonded hydrogen and mercaptoalkyl hydrogen, at least one of (a) and (b) having an average of more than two of said olefinic radicals and said hydrogen radicals, respectively, per molecule, and

(II) exposing the dispersion of (I) to ultraviolet radiation until the liquid organopolysiloxane composition is converted to the solid state.

---

## 4,370,161
## ORE REDUCTION USING CALCIUM OXIDE DESULFURIZATION

**Ethem T. Turkdogan, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 154,731, May 29, 1980. This application May 7, 1981, Ser. No. 261,397**

**Int. Cl.³ C21B *13/00, 15/00*; C01B *17/00***

**U.S. Cl. 75—34** **12 Claims**

1. A process for reducing ore comprising (a) contacting a sulfur bearing hot reducing gas or carbonaceous material with a desulfurizing agent comprising a bed of solid particles comprising calcium oxide and ore to thereby produce a low-sulfur content hot reducing gas stream which reduces the ore, a reduced ore, and a calcium sulfide composition, (b) separating the reduced ore from the other products of step (a), and then (c) contacting said calcium sulfide composition with hot liquid water at a temperature and corresponding pressure sufficient to maintain steam in the system and wherein a major portion of

said calcium sulfide composition has a particle size of less than about 6 mesh to thereby convert the sulfide of said composition to calcium hydroxide and hydrogen sulfide.

---

**4,370,162**

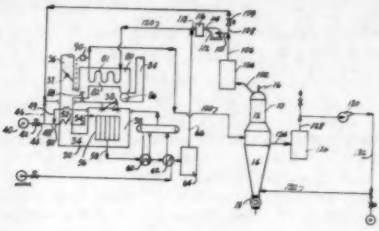
## METHOD FOR THE GASEOUS REDUCTION OF IRON ORE TO SPONGE IRON

**Carlos Dominguez-Abedo, and Carlos Guzman-Bofill, both of Garza Garcia, Mexico, assignors to Hylsa, S.A., Monterrey, Mexico**

**Continuation-in-part of Ser. No. 191,941, Sep. 29, 1980. This application Mar. 20, 1981, Ser. No. 246,076**

**Int. Cl.³ C21B *13/02***

**U.S. Cl. 75—90 R** **5 Claims**



1. A method for reducing particulate metal ore to sponge metal in a vertical shaft, moving bed reactor having a reduction zone for reducing said particulate metal ore in which a hot reducing gas largely composed of carbon monoxide and hydrogen is caused to flow through said reduction zone to reduce the metal ore therein to metal, which comprises the steps of withdrawing substantially all of the reducing gas from the reactor as an effluent gas, removing water from the effluent gas, feeding a portion of said effluent gas to a first heating unit to heat said gas and feeding the remaining portion of said effluent gas to a second heating unit, recycling at least a portion of said effluent gas to said reactor to form a reducing gas loop, reforming a hydrocarbon-containing gas in a catalytic reformer at an elevated temperature to produce make-up reducing gas fed to said loop and burning a suitable fuel to produce hot combustion products for heating said gas in said reformer, said second heating unit being integrated with the reformer to enable the hot combustion products produced in said reformer to be passed in heat exchange relationship with the effluent gas fed to said second heating unit, combining the heated effluent gas from the first and second heating units and feeding said combined gas stream to said first heating unit to reheat said gas stream further prior to being recycled to the reduction zone of the reactor.

---

**4,370,163**

## HYDROGEN STORAGE ALLOY AND PROCESS FOR MAKING SAME

**Yoshio Moriwaki, Hirakata; Takaharu Gamou, Fujiidera; Nobuyuki Yanagihara, Hirakata; Toshio Yamashita, Katano, and Tsutomu Iwaki, Yawata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Filed Sep. 4, 1980, Ser. No. 184,173**

**Claims priority, application Japan, Sep. 7, 1979, 54-115507; Sep. 26, 1979, 54-124616; Feb. 15, 1980, 55-18103**

**Int. Cl.³ C22C *14/00, 38/14*; C01B *6/24***

**U.S. Cl. 420—582** **9 Claims**

1. A hydrogen storage alloy of the general formula

$$Ti_{1-z}A_xFe_{y-z}B_z$$

wherein A is Hf or a mixture thereof with Zr, B is at least one member selected from the group consisting of Cr, Cu, Co, Mo, V, Ni, Nb, Mn and a mixture thereof, x is a value of from 0.01 to 0.1 when A is Hf, y is a value of from 0.85 to 1.15 when A is Hf, and z is zero or a value of from 0.01 to 0.10 when A is Hf.

---

**4,370,164**

## YELLOW METAL ALLOY

**William R. Harris, Edina, and Harold G. Jache, Owatonna, both of Minn., assignors to Jostens Inc., Minneapolis, Minn.**

**Filed Jan. 2, 1981, Ser. No. 222,152**

**Int. Cl.³ C22C *5/06***

**U.S. Cl. 420—503** **8 Claims**

1. An alloy consisting essentially of 4% to 10% by weight gold, 54% to 61% by weight silver, 14% to 19% by weight copper, 4% to 7% by weight palladium, 9% to 14% by weight indium, 1% to 3% by weight zinc and 0.015% to 0.04% by weight boron.

---

**4,370,165**

## LOW SILVER DENTAL AMALGAM ALLOY COMPOSITION

**Robert De Luca, Pennington, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.**

**Filed May 21, 1981, Ser. No. 265,883**

**Int. Cl.³ C09K *3/00***

**U.S. Cl. 106—35** **3 Claims**

1. A composition adapted for amalgamation with mercury to form a dental amalgam, which consists esentially of a uniform mixture of:

(a) A first alloy composed of at least 65 weight percent silver, up to 29 weight percent tin, up to 6 weight percent copper, and up to 2 weight percent zinc; and

(b) A second alloy composed of from 46 to 51 weight percent silver, from 4 to 6 weight percent tin, and from 45 to 48 weight percent copper,

wherein, when said composition is mixed with from 40 to 60 weight percent memory, based on weight of said composition plus mercury, the resulting dental amalgam has the following properties:

1-hour compressive strength, at least 16,000 psi; 24 hour compressive strength, at least 50,000 psi; percent flow, less than 1; dimensional change, less than ±15 microns/centimeter; creep, less than 0.5 percent; and working time, from 2 to 6 minutes,

the said components (a) and (b) being present in proportions of from 33 to 67 weight percent (a) and from 67 to 33 weight percent (b), the percentage being based on weight of (a) plus (b).

---

**4,370,166**

## LOW DENSITY CEMENT SLURRY AND ITS USE

**Charles A. Powers; George B. Holman, both of Tulsa, and Robert C. Smith, Inola, all of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Continuation-in-part of Ser. No. 183,888, Sep. 4, 1980, Pat. No. 4,305,758, which is a continuation-in-part of Ser. No. 163,030, Jun. 25, 1980, abandoned, which is a division of Ser. No. 47,533, Jun. 11, 1979, Pat. No. 4,252,193, which is a continuation-in-part of Ser. No. 932,052, Aug. 8, 1978, abandoned. This application Sep. 17, 1981, Ser. No. 303,306**

**The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.**

**Int. Cl.³ C04B *7/02***

**U.S. Cl. 106—97** **20 Claims**

1. A hydraulic cement slurry which comprises as its essential components:

hydraulic cement, about 8 to about 50 weight percent hollow glass microspheres by weight of the cement and sufficient water to form a pumpable slurry, wherein the API free water content of said slurry is no more than about 2 volume percent based only on said hydraulic cement and said microspheres, and said microspheres have ANSI/ASTM D 2840-69 average true particle densities of at least 0.2 gm/cm³, ANSI/ASTM D 3102-72 hydrostatic

collapse strengths of at least 500 psi (3447 kPa) and average particle diameters of less than about 500 microns.

---

**4,370,167**

## ASBESTOS-FREE DRYWALL JOINT COMPOUND UTILIZING SEPIOLITE CLAY AS ASBESTOS SUBSTITUTE

**Patrick J. Modd, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.**

**Filed Mar. 15, 1982, Ser. No. 358,264**
**Int. Cl.³ C04B *1/00***
**U.S. Cl. 106—119** **6 Claims**

1. A drywall joint compound, said compound being free of asbestos fiber and attapulgite clay, and comprising as dry solids, by weight, from about 50 to 98% of fine ground powdered fillers of about minus 325 mesh particle size and other than sepiolite clay, from about 1 to 50 percent of a binder composition for said filler, from about 0.1 to 5 percent of a thickener other than sepiolite clay, and from about 0.1 to 5 percent fine powdered sepiolite clay.

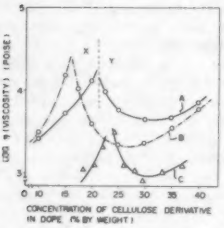
---

**4,370,168**

## MESOPHASE DOPE CONTAINING CELLULOSE DERIVATIVE AND INORGANIC ACID

**Kenji Kamide, Ikoma; Kunihiko Okajima, and Toshihiko Matsui, both of Takatsuki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan**

**Filed Sep. 19, 1980, Ser. No. 188,854**
**Claims priority, application Japan, Sep. 21, 1979, 54/120718; Sep. 25, 1979, 54/121960**
**Int. Cl.³ C08L *1/26***
**U.S. Cl. 106—177** **10 Claims**




1. A mesophase dope comprising at least 15% by weight of at least one cellulose ether, dissolved in an aqueous solution of at least 5% by weight of at least one inorganic acid, said dope exhibiting a mesophase property even in the case where no fluid dynamic stress is applied thereto.

---

**4,370,169**

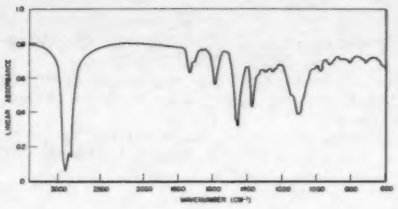
## AQUEOUS DISPERSION OF GLASS FIBERS AND METHOD AND COMPOSITION FOR PRODUCING SAME

**Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Dec. 31, 1980, Ser. No. 221,741**
**Int. Cl.³ C04B *43/02*; D21F *11/00*; C08L *91/00***
**U.S. Cl. 106—267** **31 Claims**

1. An aqueous sizing composition for glass fibers having filament diameters larger than around 13 microns to render glass fibers more readily dispersible in aqueous solutions, comprising:

a. about 0.1 to about 50 weight percent of a blend of alkyl sulfate quaternary of an alkyl amino fatty acid amine or amide and a liquid mineral oil-inorganic silica defoaming agent made water dispersible with a compatible surfactant where the amount of the quaternary material is in the range of about 50 to about 95 weight percent of the blend




and the amount of the defoaming agent is around 5 to about 50 weight percent of the blend; and

b. water.

---

**4,370,170**

## PRODUCING MINIMUM ASPHALT-CONTAINING CATIONIC EMULSIONS EMPLOYING SPECIFIC CONDUCTANCE

**William J. Tolonen, and Armin C. Pitchford, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Mar. 23, 1981, Ser. No. 246,543**
**Int. Cl.³ C08L *95/00***
**U.S. Cl. 106—277** **7 Claims**

1. A method for preparing an asphalt-in-water emulsion which comprises preparing an emulsifying solution, adjusting the pH of said emulsifying solution to be in the range of about 3 to about 5, increasing the measured, specific conductance of the solution to a value that is in a range of about 900 to about 46,000 micromhos by varying the amount of ionizing salt added to the solution and then compounding the thus prepared solution with asphalt under suitable blending conditions.

---

**4,370,171**

## METHOD FOR DISPERSING COMMINUTED SOLIDS

**Glenn N. Robinson, Terre Haute, and Charles E. Seeney, Brazil, both of Ill., assignors to Angus Chemical Co., Northbrook, Ill.**

**Filed Feb. 2, 1981, Ser. No. 230,249**
**Int. Cl.³ C09C *1/36, 1/24***
**U.S. Cl. 106—300** **21 Claims**

1. A method for dispersing a comminuted solid in an aqueous medium comprising the step of using as a dispersant a combination of an alkanolamine with a polymeric carboxylic acid selected from the group consisting of polyacrylic acid, polymethacrylic acid and carboxymethyl cellulose.

8. The method of claim 1 wherein the alkanolamine is present in the combination in an equivalent weight ratio of about 1:1.

13. The method of claim 8 wherein the amount of dispersant is from 0.1 to 1.0%.

18. The slurry of claim 13 wherein the pigment is titanium dioxide.

---

**4,370,172**

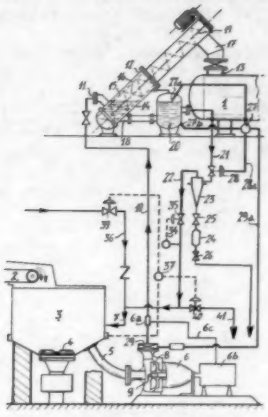
## CONTROLLED VORTEX PUMP FEED FOR SUPPLYING CELLULOSE-CONTAINING MATERIAL TO REACTION VESSEL

**Charles Gueissaz, Neuilly-sur-Seine, France, assignor to Compagnie de Construction Mecanique Sulzer, French Societe Anonyme, Paris, France**

**Filed Mar. 17, 1981, Ser. No. 244,728**
**Int. Cl.³ C13K *1/02***
**U.S. Cl. 127—1** **9 Claims**

3. Apparatus for feeding vegetable material into a treatment enclosure under pressure to subject the material in the enclo-

sure to a reaction under pressure, said apparatus comprising means for shredding the material into fragments and impregnating and diluting the material with a treating liquid so as to produce a liquid-solid mixture; a vortex pump, downstream of said means for feeding the mixture through a pipe under pressure into the treatment enclosure; a variable-speed motor for driving the pump; and means including a flow meter in said pipe and controlling the speed of said variable-speed motor in dependence on the flow rate measured by said flow meter so as to maintain the rate of flow through said pipe at a constant value.



---

## 4,370,173
## COMPOSITION AND METHOD FOR ACID CLEANING OF ALUMINUM SURFACES

**David Y. Dollman, Doylestown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.**

**Continuation-in-part of Ser. No. 263,838, May 15, 1981, abandoned. This application Apr. 30, 1982, Ser. No. 373,211**

**Int. Cl.³ B08B** *3/08;* **C23G** *1/12;* **C11D** *7/08*

**U.S. Cl. 134—3** **16 Claims**

8. A process for cleaning an aluminum surface comprising the steps of (a) contacting said surface with an aqueous cleaning solution comprising from about 1 to about 10 grams/liter of sulfuric acid, from about 0.005 to about 0.1 grams/liter of hydrofluoric acid, and from about 0.1 to about 10 grams/liter of alkali metal 2-butoxyethoxyacetate, and (b) rinsing the aluminum surface to remove the cleaning solution.

---

## 4,370,174
## METHOD FOR REMOVING ADHESIVE RESIDUES WITH AN EMULSION CLEANER

**Charles H. Braithwaite, Jr., 11232 Tigrina, Whittier, Calif. 90603**

**Filed Aug. 31, 1981, Ser. No. 297,979**

**Int. Cl.³ B08B** *3/08;* **C11D** *7/50*

**U.S. Cl. 134—7** **25 Claims**

1. A method for cleaning organophilic adhesive coatings from a floor surface which comprises:

(a) applying, to the surface of a floor having used and aged residues of an adhesive selected from the class of asphaltic, polyvinyl acetate and rubber base adhesives remaining after removal of flooring tile and the like, a cleaning composition consisting essentially of;

(i) from 40 to about 80 weight percent of an organic solvent having a flash point above about 140 degrees F.;

(ii) from 20 to about 60 weight percent of an inorganic solid adsorbent powder having a particle size passing a 100 mesh screen;

(iii) a water-in-oil surfactant in an amount from 0.002 to about 0.01 weight percent, sufficient to form said cleaning composition into an oil external phase emulsion;

(iv) an oil-in-water surfactant in an amount from 0.001 to about 0.05 weight percent, sufficient to convert said oil external phase emulsion to a water external phase emulsion upon the addition of water thereto; and .

(v) no greater than 20 weight percent water;

(b) permitting said cleaning composition to remain in contact with said adhesive coating for a time sufficient to soften said adhesive;

(c) scrubbing said surface to loosen said adhesive coating and to work the loosened adhesive into said composition, forming an emulsion having a whipped consistency;

(d) adding water to said emulsion of whipped consistency in an amount greater than the volume of said cleaning composition sufficient to convert said emulsion to a water external phase emulsion; and

(e) removing said water external phase emulsion from said substrate.

---

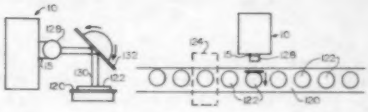
## 4,370,175
## METHOD OF ANNEALING IMPLANTED SEMICONDUCTORS BY LASERS

**Jeffrey I. Levatter, Encinitas, Calif., assignor to Bernard B. Katz, LaJolla, Calif.**

**Filed Dec. 3, 1979, Ser. No. 100,025**

**Int. Cl.³ H01L** *21/26, 21/268*

**U.S. Cl. 148—1.5** **12 Claims**



1. A method of producing solar voltaic cells comprising implanting a dopant material into a photo sensitive semiconductor substrate to create a P-N junction, and annealing said substrate with a pulsed laser beam having a wavelength predominantly in the ultraviolet region, a suitable beam annealing energy of at least two joules per pulse, a pulse repetition rate of at least 100 pulses per second and a uniformity of beam pulse output that varies by no more than five percent across the area of beam output.

---

## 4,370,176
## PROCESS FOR FAST DROPING OF SEMICONDUCTORS

**Michel Bruel, Veurey-Voroize, France, assignor to Commissariat a l'Energie Atomique, Paris, France**

**Filed Jan. 23, 1981, Ser. No. 227,763**

**Claims priority, application France, Feb. 1, 1980, 80 02239**

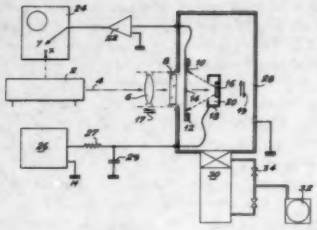
**Int. Cl.³ H01L** *21/263;* **H01J** *37/30, 27/00*

**U.S. Cl. 148—1.5** **16 Claims**

1. A process for fast doping of semiconductors consisting of implanting foreign particles in a substrate and in rendering said particles electrically active so as to modify the physical properties of said substrate, comprising the steps of:

subjecting said substrate to a bombardment closely in time and space of said foreign particles constituting a dopant material wherein an energy brought by each particle when it is implanted in said substrate is adjusted so as to produce in cooperation with the other particles a local liquefaction of said substrate;

allowing said particles to be positioned in substitutional sites of the crystal lattice of said substrate; and



allowing said crystal lattice which was disturbed when said particles penetrated in said substrate, to be rearranged.

---

**4,370,177**

## COATING SOLUTION FOR METAL SURFACES

**Frank J. Frelin, Norristown; Timm L. Kelly, Oreland, and Anthony J. Malloy, Willow Grove, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.**

**Continuation-in-part of Ser. No. 165,734, Jul. 13, 1980, Pat. No. 4,313,769. This application Oct. 9, 1981, Ser. No. 310,175**

**The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.**

**Int. Cl.³ C23F *7/06***

**U.S. Cl. 148—6.27** **21 Claims**

1. An acidic aqueous coating solution which is effective in forming a non-resinous, non-chromate, corrosion-resistant coating on an aluminum surface, said solution consisting essentially of

(a) a metal containing substance wherein the metal is selected from the group consisting of zirconium, titanium, and hafnium ions, and mixtures of two or more of said substances, said metal being present in the solution in an amount of at least about $0.5 \times 10^{-3}$ m/l,

(b) fluoride in an amount at least sufficient to combine with all of said metal, and

(c) at least two surfactants present in amounts such that the coating formed from said solution has an improved tendency to resist being discolored by hot water, and wherein when two surfactants are present they are present in a weight ratio of from about 0.3:1 to about 3:1.

---

**4,370,178**

## METHOD OF MAKING AS-PIERCED TUBULAR PRODUCTS

**George M. Waid, Burton, and Anthony T. Davenport, Shaker Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio**

**Filed Jun. 30, 1981, Ser. No. 278,997**

**Int. Cl.³ C21D *8/10***

**U.S. Cl. 148—12 F** **1 Claim**

1. A process of making as-pierced steel casing characterized in the as-pierced condition by a yield strength of 80–110 ksi, a minimum ultimate tensile strength of 100 ksi, a minimum elongation of 12½% in two inches, and by a ferrite-pearlite microstructure having a ferrite grain size of about ASTM 7 or finer, comprising the steps providing a killed steel consisting essentially in percent by weight of 0.20–0.35 carbon, 1.0–2.0 manganese, up to about 0.60 silicon, up to about 0.04 for each of phosphorous and sulfur, 0.05–0.25 vanadium, at least one of from 0.005–0.025 nitrogen and from 0.01–0.10 columbium, and the balance iron, heating said steel to a temperature of at least about 2200° F. to dissolve vanadium carbides, piercing said steel, and allowing said steel to cool from said temperature to effect precipitation of vanadium carbides with resulting refinement of austenite to a grain size of about ASTM 5 or finer and of ferrite to a grain size of about ASTM 7 or finer.

---

**4,370,179**

## METHOD OF MAKING A MONOLITHIC COMPLEMENTARY DARLINGTON AMPLIFIER UTILIZING DIFFUSION AND EPITAXIAL DECOMPOSITION

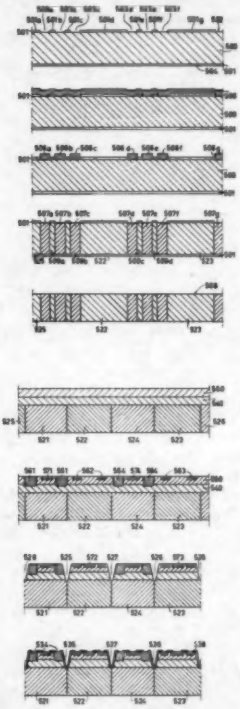
**Bernard Roger, Carpiquet, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Division of Ser. No. 960,426, Nov. 13, 1978, Pat. No. 4,261,002. This application Oct. 27, 1980, Ser. No. 200,645**

**Claims priority, application France, Nov. 13, 1978, 77 34126**

**Int. Cl.³ H01L *21/20, 21/76, 21/80***

**U.S. Cl. 148—175** **9 Claims**



1. A method of manufacturing a semiconductor device of the type comprising a semiconductor body having at least first and second bipolar and complementary vertical transistors, each transistor comprising a central base region and two external regions serving as emitter and collector regions, said body comprising a substrate covered by a first epitaxial layer of a first conductivity type on which extends a second epitaxial layer of the second conductivity type opposite to the first, the base region of the first transistor and at least a part of an external region of the second transistor being formed by coplanar portions of the first epitaxial layer, the base region of the second transistor and at least a part of an external region of the first transistor being formed by coplanar portions of the second epitaxial layer and a first portion of the substrate comprising at least a part of the collector region of one of said first and second transistors, an insulating barrier separating entirely at least part of said portions of the second epitaxial layer, characterized in that at least a part of the emitter region of the other

transistor comprises a second substrate portion of the opposite conductivity type adjoining and coplanar with, and forming a p-n junction with said first portion, that the insulating barrier extends from the upper surface of said second epitaxial layer down to at least the substrate and that said p-n junction comprises at least a part of a junction which extends from the lower surface of the substrate up to said insulating barrier, and that an electrode is provided on the lower surface of the substrate to connect the first and second substrate portions, the method comprising the steps of:

providing a semiconductor plate of the first conductivity type and comprising said substrate;

locally introducing impurities capable of producing the second conductivity type into at least a portion of said substrate, in a concentration exceeding that of the concentration of impurities in said plate, to form at least a portion of semiconductor material of the second conductivity type in said substrate, the final thickness of said substrate being limited to the thickness of said portion of the second conductivity type;

epitaxially growing a lightly-doped first epitaxial layer of a selected conductivity type on a major surface of said substrate;

epitaxially growing a lightly-doped second epitaxial layer of opposite conductivity type to that of said selected conductivity type on said first epitaxial layer;

forming a plurality of localized semiconductor regions in said second epitaxial layer, including at least first and second localized regions of said selected conductivity type, said first localized region extending through said second epitaxial layer and comprising the base contact of said first transistor, and said second localized region being formed within said second epitaxial layer and comprising an external region of said second transistor;

providing said insulating barrier on said second epitaxial layer; and

providing said electrode on the lower surface of said substrate.

---

**4,370,180**

## METHOD FOR MANUFACTURING POWER SWITCHING DEVICES

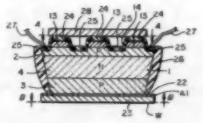
**Makoto Azuma, and Junko Akagi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Continuation-in-part of Ser. No. 193,142, Oct. 2, 1980, abandoned. This application Dec. 4, 1980, Ser. No. 213,099**

**Claims priority, application Japan, Oct. 3, 1979, 54-12671; Nov. 30, 1979, 54-154305**

**Int. Cl.³ H01L *21/225***

**U.S. Cl. 148—187** **7 Claims**



1. A method for manufacturing power thyristors, comprising the steps of:

preparing an N-type semiconductor substrate;

forming respective P-type layers on both sides of the semiconductor substrate, one of the layers constituting a P-type base layer, the other layer constituting an anode layer and the N-type substrate located therebetween constituting an N-type base layer;

forming a first film containing N-type impurities on the P-type base layer and doping the N-type impurities into the surface region of the semiconductor substrate;

removing the first film;

heating the semiconductor substrate in order to drive the N-type impurities more deeply into the P-type base layer and making an N-type cathode layer;

forming an oxide layer on the N-type cathode layer;

forming respective second films containing phosphorus as gettering material on both the oxide layer and the P-type anode layer in order to increase the carrier lifetime of the P-type base layer;

removing the second films; and

diffusing carrier lifetime killer atoms into the N-type base layer in order to decrease the carrier lifetime thereof.

---

**4,370,181**

## PYROTECHNIC NON-AZIDE GAS GENERANTS BASED ON A NON-HYDROGEN CONTAINING TETRAZOLE COMPOUND

**Norman H. Landstrom, Tacoma, Wash., and Graham C. Shaw, Garland, Utah, assignors to Thiokol Corporation, Newtown, Pa.**

**Filed Dec. 31, 1980, Ser. No. 221,943**

**Int. Cl.³ C06B *45/00***

**U.S. Cl. 149—2** **18 Claims**

1. A solid pellet for generating non-toxic nitrogen gas consisting essentially of a non-hydrogen containing tetrazole compound and a non-oxygen containing oxidizer selected from the group consisting of sulfur, chromium trichloride, molybdenum disulfide, iron trifluoride, and admixture thereof.

---

**4,370,182**

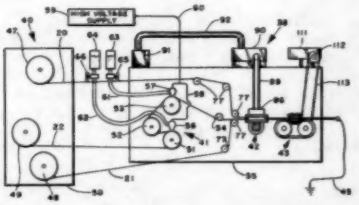
## METHOD OF MAKING TAPE TRANSDUCER

**Jon Becker, Milpitas; Kirby G. Miller, Saratoga, and Charles F. Burney, Orland, all of Calif., assignors to GTE Products Corporation, Stamford, Conn.**

**Division of Ser. No. 244,491, Mar. 16, 1981, Pat. No. 4,344,810. This application Dec. 17, 1981, Ser. No. 331,490**

**Int. Cl.³ H01B *13/10, 13/26***

**U.S. Cl. 156—52** **4 Claims**



1. A method of making a composite tape transducer comprising an inner strip means having an elongated electrically conductive inner strip and dielectric layers on opposite sides of the inner strip, thereof and a pair of electrically conductive outer strips having widths larger than the width of said inner strip consisting of the steps of

electrically grounding said inner strip,

moving the inner strip means relative to first and second electrodes with one of said dielectric layers adjacent in electrical contact with the first electrode and the other of said layers in electrical contact with the second electrode,

continuously applying a DC voltage across said electrodes and said inner strip whereby to electrically charge said dielectric layers,

moving said outer strips into engagement with opposite sides, respectively, of said inner strip means, and

sealing marginal edge portions of said outer strips together.

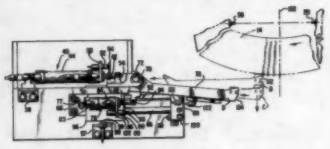
## 4,370,183
## APPARATUS AND METHOD FOR HOLDING AND TACKING MATERIAL

**Ronald T. Albo, Los Gatos, Calif., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Continuation of Ser. No. 102,192, which matured from PCT/US79/00917, Oct. 29, 1979, Publication No. W081/01119, Apr. 30, 1981, 102(e) date Oct. 29, 1979, abandoned.**

**Int. Cl.³ B29H** *17/02*

**U.S. Cl. 156—117** **16 Claims**



**10**. A method for holding and tacking material (**12**) without slack to a body (**14**) during start up and upon stopping the winding of said material (**12**) on said body (**14**), said body (**14**) being movable in a plane about the axis of rotation of said body (**14**), a shuttle being (**22**) rotatably driven about said body (**14**) in a plane transverse to said body (**14**) and having a supply of material (**12**) carried by said shuttle (**22**), said material (**12**) being drawn from said supply and being advanced to said body (**14**) without slack, comprising:

clamping the material (**12**) to a tacker arm (**76**);

moving said tacker arm (**76**) and said material (**12**) into a contact position against the surface of said body (**14**);

holding said tacker arm (**76**) against said body (**14**) as said tacker arm (**76**) is moved in a generally tangential direction in response to moving said body (**14**);

unclamping the material (**12**) from said tacker arm (**76**) in response to moving the tacker arm (**76**) to a predetermined position; and

moving the tacker arm (**76**) to a position spaced from said body (**14**).

---

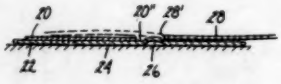
## 4,370,184
## PHOTOGRAPHIC FILM SPLICER

**Gerald A. Jensen, Plymouth, and Ted G. Merry, Lindstrom, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.**

**Division of Ser. No. 207,453, Nov. 17, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 322,021**

**Int. Cl.³ G03D** *15/04*

**U.S. Cl. 156—157** **2 Claims**




**1**. A method of splicing strips of undeveloped photographic film to form an elongated web of photographic film for developing comprising:

applying a heat activatable splice tape to ends of the photographic film strips, the splice tape defining a spliced area on the film strip ends;

applying heat and pressure to the tape and the strips to bond the tape to the ends of the strips; and

applying heat and pressure to an area of one of the photographic film strips proximate an edge of the splice tape outside the spliced area to form a ramp on the film strip proximate the edge of the splice tape outside of the spliced area, the ramp having an inclined portion positioned on a side of the ramp away from the splice tape; such that when the web is severed into individual segments of developed photographic film after the web has been developed and the splice remains attached to one of the segments, and when the severed segments are stacked a leading edge of a trailing film segment which is being stacked on top of the segment with the splice attached initially engages the inclined portion of the ramp and is deflected upward and over the edge of the splice tape, thereby avoiding contact with the edge of the splice tape.

---

## 4,370,185
## TAPE FIXING DEVICE

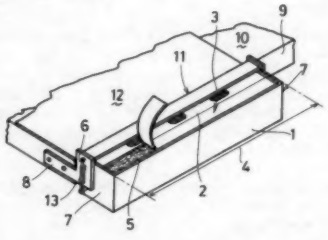
**William I. Barker, and Ernest J. Denham, both of Johannesburg, South Africa, assignors to Suspendex (Proprietary) Limited, Johannesburg, South Africa**

**Filed Jun. 5, 1981, Ser. No. 270,724**

**Claims priority, application South Africa, Jun. 6, 1980, 80/3381**

**Int. Cl.³ B65C** *9/08*

**U.S. Cl. 156—565** **5 Claims**




**1**. An apparatus for affixing an edge tape to an aligned edge of a sheet of paper (**12**) or the like, comprising:

(a) an elongate container (**1**) for storing a stack of edge tapes in the form of adhesive strips (**2**),

(b) a dispensing opening (**3**) defined in one longitudinal side of said container,

(c) a strip retaining member of said container disposed adjacent said opening,

(d) biasing means disposed within said container for urging a stack of strips towards said retaining member,

(e) a sheet support member (**10**), and

(f) means (**6,7,8**) rotatably mounting said container to said support member such that said container may be rotated between a first position whereat the dispensing opening is closely proximate and directly overlies the support member such that an adhesive strip may be applied through said opening to a sheet of paper disposed on said support member, and a second position whereat the container serves as an abutment edge against which a sheet of paper may be positioned to receive an adhesive strip and whereat the dispensing opening is exposed to access to enable the removal of a protective covering overlying an adhesive surface of a top one of said strips.

---

## 4,370,186
## METHOD FOR MANUFACTURING A METAL-PLASTICS COMPOSITE TUBE AND APPARATUS FOR CARRYING OUT SAID METHOD

**Jean-Claude Blandin, and Louis Richard, both of Cholet, France, assignors to Nadia Nicoll, Societe a responsabilite limitee, Cholet, France**

**Filed Dec. 19, 1980, Ser. No. 218,261**

**Int. Cl.³ B29D** *23/04, 23/10*

**U.S. Cl. 156—203** **8 Claims**

**1**. A method for the manufacture of a metal tube having two

layers of plastics materials coated on the internal surface thereof, comprising:

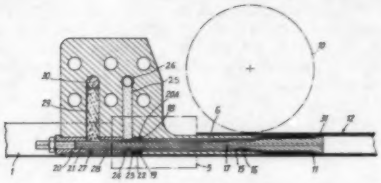
(a) moving a strip of metal into a forming means;

(b) forming the strip into a tube with the longitudinal edges of the strip being in edge contact;

(c) disposing an extrusion nozzle, having an elongated projecting portion, into the formed tube;

(d) seaming the formed tube at the said edge contact;

(e) providing a first and second source of flowable plastic material, each source having communication with the said nozzle, and the first source of plastic material being



grafted polyethylene polymer and the second source of plastic material being another polymer;

(f) extruding the first and second plastic materials through respective orifices in the said nozzle such that concentric tubular forms thereof are produced, and wherein the first plastic material surrounds the second plastic material and forms an outer concentric tube; and

(g) urging the first and second plastic materials radially outward whereby the first plastic material contacts the inner surface of the seamed tube and bonds thereto and the second plastic material contacts the first plastic material and bonds thereto.

---

**4,370,187**

## PROCESS AND APPARATUS FOR PRODUCING A LAMINATED STRUCTURE COMPOSED OF A SUBSTRATE WEB AND A THERMOPLASTIC RESIN WEB EXTRUSION-COATED THEREON

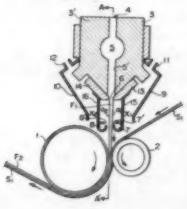
**Mikio Katagiri, Ichihara; Yukio Sakota, Chiba; Kunie Hiroshige, and Yukio Adachi, both of Ichihara, all of Japan, assignors to Mitsui Polychemicals Co. Ltd., Tokyo, Japan**

**Filed Dec. 18, 1980, Ser. No. 217,577**

**Claims priority, application Japan, Dec. 21, 1979, 54-165516**

**Int. Cl.³ B32B** *31/30*

**U.S. Cl. 156—244.23** **10 Claims**



1. In a process for producing a laminated structure composed of a substrate web and a thermoplastic resin web extrusion-coated thereon which comprises melt-extruding a thermoplastic resin from the lip of a T-die composed of a die body and a die jowl to form a thermoplastic resin web in the molten state and passing the thermoplastic resin web together with a substrate in web form through a laminating roll unit consisting at least of a pair of a cooling roll and a nip roll and located apart from the die lip with an air-gap space formed between the die lip and the laminating roll unit, the improvement comprising

(1) blowing an oxidizing gas selected from the group consisting of oxygen, ozone, air, a mixture of at least two of these, and a mixture of at least one of oxygen and ozone with an inert gas in said air-gap space to that surface of the molten thermoplastic resin web which is to make contact with the substrate web, at a flow rate of about 0.02 to about 2 $Nm^3$ per kilogram of the thermoplastic resin extruded, whereby volatile substances evolved from said surface of the molten thermoplastic resin web are blown off said surface and removing said oxidizing gas and said volatile substances from the air-gap space, and

(2) blowing an inert gas in said air-gap space to that surface of the molten thermoplastic resin web which is to make contact with the cooling roll, at a flow rate of about 0.02 to about 2 $Nm^3$ per kilogram of the thermoplastic resin extruded, whereby volatile substances evolved from the surface of the molten thermoplastic resin web are blown off said surface and removing said inert gas and said volatile substances from the air-gap space.

---

**4,370,188**

## METHOD AND APPARATUS FOR INSULATING COILS FOR ROTARY ELECTRIC MACHINES

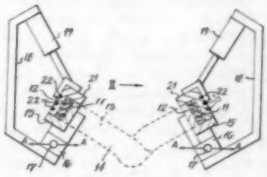
**Malcolm Otty, Westering, Mill Hay Rd., Caldy, Merseyside, England**

**Filed Jul. 9, 1981, Ser. No. 281,724**

**Claims priority, application United Kingdom, Jul. 9, 1980, 8022523**

**Int. Cl.³ B29C** *15/00, 27/26;* **B32B** *31/20*

**U.S. Cl. 156—245** **10 Claims**



1. In a method for applying and curing wrapped resin impregnated insulation about a coil for a rotary electric machine, said coil having spaced parallel straight side portions, using press apparatus having a plurality of pressure applying means for each of said side portions including inner pressure applying means remote from ends of said coil and outer pressure applying means disposed on either side of said inner pressure applying means along said straight side portions, the improvement comprising:

applying pressure first by said inner pressure applying means and thereafter applying pressure by said outer pressure applying means, wherein excess resin is caused to flow toward said end portions of said coil from said straight side portions.

---

**4,370,189**

## MODIFYING THERMOPLASTIC MATERIALS AND PRODUCTS THEREOF

**Roy W. Siedenstrang, Akron, and Agmund K. Thorsrud, Bath, both of Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Dec. 16, 1980, Ser. No. 217,069**

**Int. Cl.³ B29C** *19/02*

**U.S. Cl. 156—272.2** **22 Claims**

1. A method for forming a thermoplastic polyalkene surface on at least one side of a thermoplastic elastomeric product comprising:

disposing a sheet of a thermoplastic polyalkene in a mold;

disposing a body of a nonhydrogenated, unvulcanized and unvulcanizable, thermoplastic elastomeric material atop at least a portion of said sheet of polyalkene;

closing said mold; and

subjecting the resultant assembly to microwave energy at a power level, for a time and while applying a pressure sufficient to bond said sheet of polyalkene to said body of elastomeric material and form said body of elastomeric material into an elastomeric product.

---

**4,370,190**

## PEELABLE BONDED STRUCTURES AND PROCESS FOR PREPARING SAME

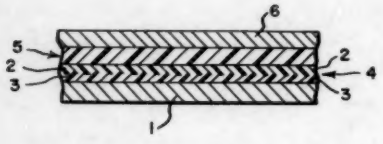
**Isao Ichinose, Hiratsuka; Fumio Mori, Yokohama, and Noboru Suzuki, Chigasaki, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan**

**Division of Ser. No. 964,188, Nov. 28, 1978, Pat. No. 4,269,321. This application Jan. 21, 1981, Ser. No. 226,556**

**Claims priority, application Japan, Nov. 29, 1977, 52-142219**

**Int. Cl.³ C09J** *5/04*

**U.S. Cl. 156—307.3** **15 Claims**




1. A process for preparing peelable bonded structures comprising a first article composed of metal and a second article bonded to the first article through a composite coating layer, said process comprising:

(a) applying to the first article a paint composition comprising (i) an olefin resin (A) modified with a copolymerized carbonyl group-containing ethylenically unsaturated monomer whereby said modified olefin resin contains carbonyl groups at a concentration of between about 0.01 and 200 milliequivalents per 100 g of the modified olefin resin and having a degree of crystallization or at least 50%, and (ii) a coating film-forming base resin (B) at an (A)/(B) weight ratio of between about 0.2/99.8 and 40/60 and having a density greater by about 0.1 than the density of the modified olefin resin in a mixed solvent containing at least about 70% by weight of a solvent compenent having a solubility parameter of between about 8.5 and 9.5, said mixed solvent being further characterized in that the difference between the boiling points of the highest and lowest boiling solvent components is at least about 20° C.;

(b) curing the applied paint composition to form a first coating layer having a multi-layer distribution structure with resin concentration gradients in the thickness direction such that the modified olefin resin is distributed predominantly in the portion contiguous to the interface between the first and second coating layers and the base resin is distributed predominantly in the opposite portion;

(c) applying another paint composition onto the first coating layer to form a second coating layer; and

(d) heat-bonding a second article to the second coating layer so that the articles have a peel strength of between about 0.05 and 5/kg/cm between the first and second coating layers.

2. A process for preparing peelable bonded structures comprising a first article composed of metal and a second article bonded to the first article through a composite coating layer, said process comprising:

(a) applying to the first article a paint composition comprising (i) an olefin resin (A) modified with a copolymerized carbonyl group-containing ethylenically unsaturated monomer whereby said modified ōlefin resin contains carbonyl groups at a concentration of between about 0.01 and 200 milliequivalents per 100 g of the modified olefin resin and having a degree of crystallization of at least 50%, and (ii) a coating film-forming base resin (B) at an (A)/(B) weight ratio of between about 0.2/99.8 and 40/60 and having a density greater by about 0.1 than the density of the modified olefin resin in a mixed solvent containing at least about 70% by weight of a solvent component having a solubility parameter of between about 8.5 and 9.5, said mixed solvent being further characterized in that the difference between the boiling points of the highest and lowest boiling solvent components is at least about 20° C.;

(b) curing the applied paint composition to form a first coating layer having a multi-layer distribution structure with resin concentration gradients in the thickness direction such that the modified olefin resin is distributed predominantly in the portion contiguous to the interface between the first and second coating layers and the base resin is distributed predominantly in the opposite portion;

(c) applying another paint composition onto the first coating layer to form a second coating layer; and

(d) heat-bonding a second article having the second coating layer pre-formed thereon to the first coating layer having the multi-layer distribution structure formed therein so that the articles have a peel strength of between about 0.05 and 5/kg/cm between the first and second coating layers.

---

**4,370,191**

## ELECTRICAL LAMINATE

**Masakazu Uekita, and Masaharu Abe, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 2, 1980, Ser. No. 164,512**

**Int. Cl.³ C09J** *5/02*

**U.S. Cl. 156—307.7** **4 Claims**

1. In a method for producing an electrical laminate comprising the steps of impregnating a paper substrate with a curable liquid resin consisting essentially of an unsaturated polyester polymer obtained by esterifying a mixture of a saturated polybasic acid component and an unsaturated polybasic acid component with a substantially stoichiometric amount of a polyol component, and a cross-linking vinyl monomer, laminating a plurality of the resin-impregnated substrates, and curing the laminate, the improvement comprising employing as said liquid resin one consisting of said curable resin which is in liquid phase at room temperature, has a viscosity of 0.1–30 poise and, when fully cured, has a glass transition point from about 20° C. to 80° C.

---

**4,370,192**

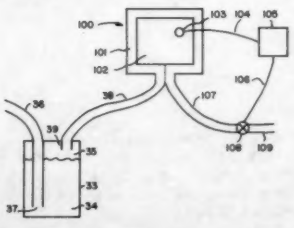
## APPARATUS FOR CHEMICAL ETCHING OF SILICON

**Richard F. Cooley, Campbell, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.**

**Filed Oct. 20, 1980, Ser. No. 198,567**

**Int. Cl.³ C23F** *1/02;* **F25B** *19/00;* **H01L** *21/306*

**U.S. Cl. 156—345** **19 Claims**




1. Structure for holding an etchant for use in etching semiconductor wafers containing on one surface thereof masking material to protect circuitry formed adjacent said one surface from said etchant comprising:

an etchant tank having an inner wall and an outer wall, for containing an etchant for use in etching a material in an exothermic reaction, thereby forming a cooling jacket within said inner and outer walls, said cooling jacket having an inlet and an outlet;

a source of coolant gas connected to said inlet of said cooling jacket;

temperature detection means for providing a signal indicative of the temperature of said etchant;

a vent connected to said outlet; and

control means responsive to said signal indicative of the temperature for controlling the flow of said coolant gas through said cooling jacket;

whereby said coolant gas removes heat generated in the exothermic reaction between said etchant and the material being etched at a rate selected to maintain the temperature of said etchant beneath a selected value wherein said selected value is selected to ensure that said etchant is maintained at a temperature sufficiently low to prevent masking material protecting circuitry from becoming less effective as a mask.

---

**4,370,193**

## INSERTION OF ACCURATELY POSITIONED CORE TUBES IN WINDING MACHINES

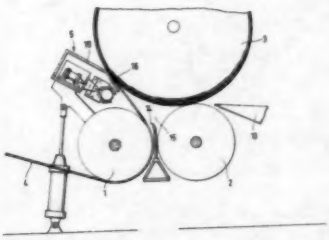
**Joachim Knauthe, Hochdahl, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany**

**Filed Dec. 4, 1980, Ser. No. 213,241**

**Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948877**

**Int. Cl.³ B65C** *3/12*

**U.S. Cl. 156—446** **1 Claim**



1. In an apparatus for insertion of an accurately positioned second core tube provided along a generatrix with means for adhering the head end of a web into the wedge formed by two rotatable support rolls of a winding machine, and for ejection of a first tube supported by said support rolls and wound with said web, the improvement which comprises a pivoted lever arm

(a) mounting a clamping means holding the new second core tube to be substituted for the first core tube about which said web is being wound, and

(b) mounting an ejector bar having a forward end,

means for pivoting said lever arm so that said forward end contacts and then ejects said first tube and web thereon from said wedge while displacing the clamping means from a first inoperative position to a second position adjacent said wedge, means for cutting the web when said first tube has been ejected, and means for opening said clamping means to release said second tube into said wedge whereupon the second tube is rotated by the support rolls and the adhering means on the second tube secures the web to the second tube for winding of said web thereon.

**4,370,194**

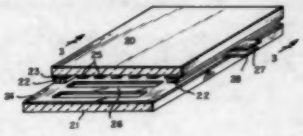
## ORIENTATION OF ORDERED LIQUIDS AND THEIR USE IN DEVICES

**David C. Shaver, Cambridge; Henry I. Smith, Sudbury, and Dale C. Flanders, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation of Ser. No. 902,332, May 3, 1978, Pat. No. 4,256,787. This application May 13, 1980, Ser. No. 149,483**

**Int. Cl.³ B05D** *1/32;* **C23F** *1/02;* **G02F** *1/13;* **H01L** *21/22*

**U.S. Cl. 156—643** **15 Claims**



1. A method for orienting the molecules of liquid crystals comprising the steps of

forming an intermediate masking layer having a predetermined pattern on a selected surface of a substrate;

transferring said predetermined pattern to said selected surface using a planar process which forms a surface relief structure having said predetermined pattern, said surface relief structure being formed so as to have substantially vertical side walls and substantially square corners; and

applying a liquid crystal to said selected surface of said substrate, said surface structure substantially orienting the molecules of said liquid crystal in accordance with said predetermined pattern.

---

**4,370,195**

## REMOVAL OF PLASMA ETCHING RESIDUES

**Bernard Halon, Brooklyn, N.Y., and John L. Vossen, Jr., Bridgewater, N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Mar. 25, 1982, Ser. No. 362,042**

**Int. Cl.³ C23F** *1/02;* **B08B** *3/12, 6/00, 7/00*

**U.S. Cl. 156—643** **5 Claims**

1. In a process of plasma etching aluminum or an alloy thereof with an etchant gas comprised of at least one carbon-containing gas, wherein etching produces residues which are not susceptible to removal by oxygen plasma or organic solvents, the improvement comprising treating said residues with a nitrogen glow discharge for a time effective to remove the residues or render them susceptible to removal by oxygen plasma or organic solvents.

---

**4,370,196**

## ANISOTROPIC ETCHING OF ALUMINUM

**John L. Vossen, Jr., Bridgewater, N.J., and Bernard Halon, Brooklyn, N.Y., assignors to RCA Corporation, New York, N.Y.**

**Filed Mar. 25, 1982, Ser. No. 362,043**

**Int. Cl.³ C23F** *1/02*

**U.S. Cl. 156—643** **8 Claims**

1. A gaseous etchant composition for aluminum and its alloys comprising boron trichloride, trichloromethane and hydrogen.

---

**4,370,197**

## PROCESS FOR ETCHING CHROME

**Oscar R. Abolafia, Endwell; Joseph G. Ameen, Apalachin, and Glenn V. Elmore, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 24, 1981, Ser. No. 276,723**

**Int. Cl.³ C23F** *1/02*

**U.S. Cl. 156—659.1** **23 Claims**

1. A method for etching chrome which comprises contact-

ing the chrome with an acidic aqueous etchant composition containing water, an inorganic acid, and at least one thiourea compound selected from the group of thiourea, substituted thiourea, or mixtures thereof.

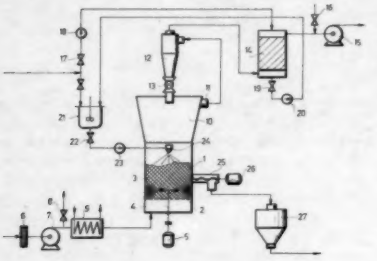
---

**4,370,198**

## METHOD AND APPARATUS FOR THE RECOVERY OF THE SOLID MATERIAL CONTENT OF SOLUTIONS AND/OR SUSPENSIONS AS GRANULES IN A GAS FLUIDIZED BED

**Bela Dencs; Zoltan Ormos, and Karoly Pataki, all of Veszprem, Hungary, assignors to Mta Muszaki Kemiai Kutato Intezet, Veszprem, Hungary**

**Filed Mar. 13, 1980, Ser. No. 130,038**
**Int. Cl.³ B01D *1/18***
**U.S. Cl. 159—48.1** **12 Claims**



1. In a method for the continuous recovery of the solid material content of liquids, in the form of granules of predetermined particle size distribution, comprising spraying a liquid having a solid material content into a fluidized bed of particles of the same solid material as that of the liquid, and continuously discharging particulate material from the bed at a rate equal to the rate of introduction of the solid material in the liquid; the improvement comprising providing in the fluidized bed a solid stationary surface, positioning a roller with its axis parallel to said fixed surface and its periphery spaced a short distance from said fixed surface so as to define a slit between said fixed surface and said periphery, and bodily moving said roller perpendicular to said axis while maintaining said slit of constant size, thereby continuously to grind said particulate material between said periphery and said fixed surface.

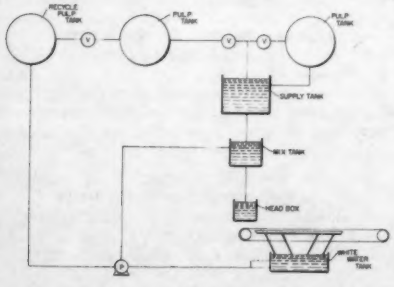
---

**4,370,199**

## ENZYMATIC CATALYZED BIOCIDE SYSTEM

**Steve A. Orndorff, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.**

**Filed Nov. 9, 1981, Ser. No. 319,298**
**Int. Cl.³ D21D *3/00***
**U.S. Cl. 162—161** **5 Claims**




1. The method of controlling the growth of slime in a pulp and paper mill process stream comprising adding to the stream an effective amount of an enzymatic biocide comprising a plant or microbial dehydrogenase enzyme selected from the group consisting of peroxidase and laccase, an oxidant selected from the group consisting of hydrogen peroxide and oxygen and an oxidizable substrate selected from the group consisting of black liquor, acid lignin, catechol, guaiacol, resorcinol or a halide salt, wherein the oxidizable substrate is oxidized to produce oxidation products which are toxic to microorganisms.

3. The method of killing and controlling the growth of microorganisms in an industrial process stream containing or having added thereto an oxidizable substrate selected from the group consisting of black liquor lignin derived phenolics comprising, adding to the stream an effective amount of an enzymatic biocide comprising a plant or microbial dehydrogenase enzyme selected from the group consisting of peroxidase and laccase and an oxidant selected from the group consisting of hydrogen peroxide and oxygen, wherein the black liquor and lignin derived phenolics are oxidized to produce oxidation products which are toxic to microorganisms.

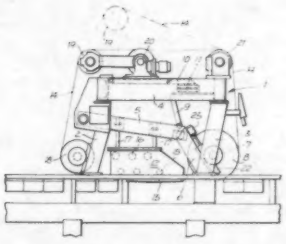
---

**4,370,200**

## METHOD OF INFLUENCING A PRE-DRAINED FIBROUS WEB ON A SCREEN

**Sylvia Schmidt, Reutlingen; Hansdieter Eckert, Eningen; Wolfgang Holzinger, Reutlingen, and Dietrich Holle, Nideggen, all of Fed. Rep. of Germany, assignors to Neue Bruderhaus Maschinenfabrik GmbH, Reutlingen and Andreas Kufferath KG, Duren-Mariaweiler, both of, Fed. Rep. of Germany, a part interest**

**Filed Nov. 19, 1980, Ser. No. 208,406**
**Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951183**
**Int. Cl.³ D21F *1/52, 3/04, 3/06***
**U.S. Cl. 162—210** **6 Claims**



1. A method of reorienting fibers in a top layer of a partially pre-drained fibrous web on a first screen including the steps of:

bringing a second continuous porous screen into contact with said fibrous web at a first contact point by means of a porous screen roller and at a second contact point by means of a porous base plate;

subjecting said fibrous web to a surface compression by means of the second continuous porous screen acting at and between the first contact point and the second contact point;

adjusting the distance between the first contact point and the second contact point so that the second continuous porous screen is in contact with said fibrous web over a variable time period;

moving the porous screen roller to adjust the surface compression between said porous screen roller and the second continuous porous screen independently of the surface compression between the porous base plate and the second continuous porous screen, said surface compression being adjusted to form a water film on at least one side of the fibrous web, thereby lowering the surface density of

the fibrous web and allowing the fibers in the top layer of said fibrous web to become re-oriented;

maintaining this surface compression between the first contact point and the second contact point over the variable time period in order to prevent water from re-entering the fibrous web and setting the re-oriented fibers in desired positions; and

removing at least a portion of the water forced from the fibrous web during the period of surface compression by causing it to pass upwardly through said second continuous porous screen.

---

**4,370,201**

## PROCESS FOR MAINTAINING COAL PROPORTIONS IN A COAL BLEND

**Douglas E. Lowenhaupt, Plum Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Jun. 23, 1981, Ser. No. 276,604**

**Int. Cl.³ C10B *45/00, 57/04***

**U.S. Cl. 201—1** **19 Claims**

1. A process for maintaining the proportions of each coal in a finely divided coal blend at a desired level, which comprises:

(1) making a spectral analysis of at least one sample of said coal blend, said sample having known desired proportions of each said coal,

(2) making a spectral analysis of a coal blend sample of unknown proportions of each said coal,

(3) comparing the spectral analyses of steps (1) and (2), and

(4) upon noting a significant difference between the spectral analyses of steps (1) and (2), making adjustments to achieve a final coal blend having proportions of each said coal closer to those of said coal blend of known desired proportions of each said coal.

---

**4,370,202**

## METHOD FOR DRY COOLING COKE AND COKE COOLER TO IMPLEMENT THE METHOD

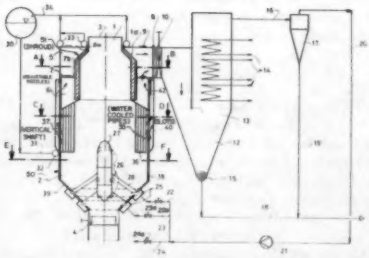
**Heinrich Weber, Lenaustr. 2, 4350 Recklinghausen; Kurt Lorenz, Habichstr. 65, 4321 Hattingen, and Horst Dungs, Am Düngelbruch 21, 4690 Herne, all of Fed. Rep. of Germany**

**Filed Nov. 19, 1980, Ser. No. 208,316**

**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952065**

**Int. Cl.³ C10B *39/00***

**U.S. Cl. 202—228** **11 Claims**



1. A coke cooler for dry cooling hot glowing coke through the recovery of the sensible heat of the hot glowing coke comprising a vertically elongated vessel at least partly surrounding a cooling chamber, a cylindrical shroud, having an internal prechamber, mounted in the upper end of said vessel and having an inlet extending therefrom for receiving a charge of the hot glowing coke and an outlet for passing the coke through the upper end of said vessel to said cooling chamber, said shroud cooperating with the vessel to provide an annular passage for fluid flow therebetween, said chamber and said annular passage being in fluid communication with each other, said vessel having an upper wall portion comprising a first plurality of pipes and membranes integrally interconnecting adjacent pipes, means for passing an inert gas to said chamber in direct counterflow contact with the coke therein and then to said annular passage to directly cool the coke, means for passing a liquid through a closed path extended through said pipes to indirectly cool the coke, discharge means at the lower end of said vessel for passing cooled coke from said chamber, wall means mounted to the outer surface of said vessel at said upper wall portion to define vertical shafts between said wall means and said upper wall portion, said membranes having a plurality of slots for fluid communication between said cooling chamber and said vertical shafts, and said vessel including a plurality of calibrating holes passing through the vessel wall to establish fluid communication between said vertical shafts and said annular passage whereby at least a part of the inert gas is passed from said inert gas passing means into said chamber, through said slots, through said shafts, through said calibrating holes and into said annular passage.

---

**4,370,203**

## COOLING DEVICE FOR COKE DRY COOLING

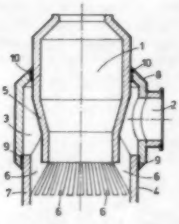
**Karl Schmid, and Wilhelm Jakobi, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany**

**Filed Feb. 2, 1981, Ser. No. 230,595**

**Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009818**

**Int. Cl.³ C10B *39/02***

**U.S. Cl. 202—228** **11 Claims**



1. A cooling device for dry cooling of coke supplied from above by gaseous cooling medium supplied from below in counterflow, the cooling device comprising a wall having an axis and forming a prechamber for supplying coke; a housing located substantially downstream of said prechamber in coke supply direction and having separate upper and lower wall; conduit means for discharging a gaseous cooling medium after passing through the coke and arranged in a predetermined upright region of said housing, said prechamber forming wall extending into said upright region and together with said housing bounding an annular hollow which has an increased cross-section in said region; means for mounting said prechamber forming wall on said housing and including a plurality of mounting members which extend between and connect said prechamber forming wall with said housing, said mounting members being spaced from one another in a circumferential direction so as to form therebetween a plurality of passages for passing the gaseous cooling medium; and means for connecting said walls with one another, said connecting means including a first sliding expansion joint provided between and slidingly connecting said upper wall with said lower wall, and a second sliding expansion joint provided between and slidingly connecting said prechamber forming wall with said upper wall.

## 4,370,204
## METHOD FOR THE PURIFICATION OF HEXAMETHYLDISILOXANE

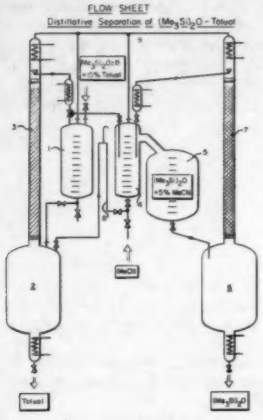
**Hans-Joachim Kötzsch, Reinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany**

**Filed Mar. 3, 1982, Ser. No. 354,466**

**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108235**

**Int. Cl.³ B01D *3/36***

**U.S. Cl. 203—39** **5 Claims**




1. Process for purifying hexamethyldisiloxane which process comprises distilling hexamethyldisiloxane in an azeotropic mixture with acetonitrile, separating the specific lighter phase from the azeotrope, and separating the hexamethyldisiloxane from the acetonitrile by distillation to recover said hexamethyldisiloxane.

---

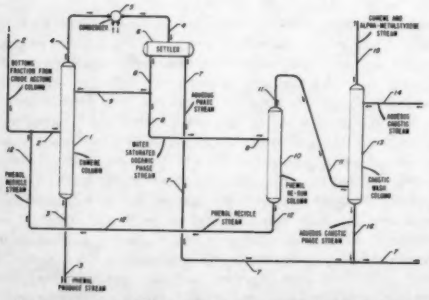
## 4,370,205
## RECOVERY OF CUMENE FROM A MIXTURE THEREOF WITH PHENOL AND WATER

**Peter R. Pujado, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Aug. 3, 1981, Ser. No. 289,592**

**Int. Cl.³ B01D *3/14*; C07C *37/74, 7/04***

**U.S. Cl. 203—75** **7 Claims**




1. A process for the recovery of a secondary alkylbenzene from a mixture thereof with water and a phenol derivative of said secondary alkylbenzene which comprises the steps of:

(a) introducing said mixture into a first fractionation column and separating a bottoms fraction comprising the major portion of said phenol derivative, and an overhead fraction comprising said secondary alkylbenzene, water and the residual portion of said phenol derivative;

(b) discharging said bottoms fraction;

(c) condensing said overhead fraction and separating an aqueous phase containing a minor portion of said residual phenol derivative, and a water-saturated organic phase comprising said secondary alkylbenzene and the balance of said residual phenol derivative;

(d) discharging said aqueous phase; and,

(e) introducing the water-saturated organic phase into a second fractionation column, separating a phenol derivative bottoms fraction, and recovering a secondary alkylbenzene overhead fraction having a reduced phenol derivative concentration substantially equivalent to that in azeotropic mixture with said saturation water.

---

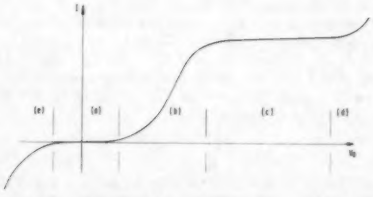
## 4,370,206
## METHOD OF OPERATING AN ELECTROCHEMICAL GAS MEASURING SYSTEM

**Gerardo A. Razumney, Philadelphia, Pa., assignor to Rexnord, Incorporated, Milwaukee, Wis.**

**Filed Jul. 6, 1977, Ser. No. 813,394**

**Int. Cl.³ G01N *27/28, 27/54***

**U.S. Cl. 204—1 T** **4 Claims**




1. In a method of operating an electrochemical gas measuring system consisting of a gas diffusion sensing electrode, an electrolyte, a non-polarizable, non-catalytic counter electrode, means for applying a bias potential between said electrodes, and means indicating the current flowing as a function of the gas concentration, the improvement comprising increasing the sensitivity of the system to a selected gas species at said gas diffusion sensing electrode by biasing said sensing electrode to a point in the limiting current plateau region of the current voltage curve for the electrochemical reaction of the gas at the sensing electrode, independent of the potential for oxidation of said selected gas species for the sensing electrode.

---

## 4,370,207
## PROCESS OF ELECTROLYTICALLY PRODUCING OXYACIDS OF CHLORINE

**Karl Lohrberg; Rainer Pfohl, both of Heusenstamm, and Martin Gritschke, Karben, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation of Ser. No. 110,155, Jan. 7, 1980. This application May 29, 1981, Ser. No. 268,421**

**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901221**

**Int. Cl.³ C25B *1/24***

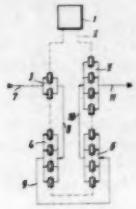
**U.S. Cl. 204—95** **4 Claims**

1. A process for producing an oxyacid of chlorine or a salt of such acid by an electrolysis of a salt solution which is contaminated with calcium and/or magnesium or of sea water, which comprises:

(a) passing said salt solution through a first electrolytic cell comprising at least one cathode and at least one anode disposed apart from one another, such that the effective velocity of the salt solution through said cell is above 0.9 meter per second and up to 2.0 meters per second; and

(b) thereafter passing the salt solution from step (a) through

at least one succeeding electrolytic cell comprising at least one cathode and anode disposed at a distance apart from one another further than said cathode and anode of said first electrolytic cell are disposed from one another and



establishing in said succeeding electrolytic cell a velocity for the salt solution of 0.3 meter per second to less than 0.7 meter per second, the velocity stated being for salt solution free from gas.

---

**4,370,208**

## ELECTROLYTIC PROCESS OF AN AQUEOUS ALKALI METAL HALIDE SOLUTION AND ELECTROLYTIC CELL

**Tokuzo Iijima, Kobe; Yasushi Samejima, Kakogawa; Kazuo Kishimoto, Takasago; Toshiji Kano; Kiyoshi Yamada, both of Kobe, and Yoshio Hatta, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 20, 1980, Ser. No. 208,843**
**Claims priority, application Japan, Nov. 27, 1979, 54-153822**
**Int. Cl.³ C25B** *1/34, 9/00*
**U.S. Cl. 204—98** **8 Claims**

1. A process for the electrolysis of an aqueous alkali metal halide solution in a cell partitioned by a cation exchange membrane into an anode compartment and a cathode compartment, which comprises supplying washing liquid continuously or intermittently into a liquid seal pot, passing cathode gas evolved from said cell into said liquid seal pot and, contacting said evolved cathode gas washing with said washing liquid in said liquid seal pot and using said washing liquid in said liquid seal pot partly or wholly as adding water for the cathode compartment.

---

**4,370,209**

## ELECTROLYTIC PROCESS INCLUDING RECOVERY AND CONDENSATION OF HIGH PRESSURE CHLORINE GAS

**Wilmer B. Graybill, and Malcolm Korach, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 14,466, Feb. 23, 1979, abandoned. This application Feb. 11, 1981, Ser. No. 233,427**
**Int. Cl.³ C25B** *1/34*
**U.S. Cl. 204—98** **13 Claims**

1. In a method of electrolyzing an aqueous alkali metal chloride brine in an electrolytic cell having an anolyte compartment with an anode therein, a catholyte compartment with a cathode therein, and a permionic membrane separator therebetween, comprising feeding the brine to the anolyte compartment, passing an electrical current from the anode to the cathode, and recovering chlorine from the anolyte compartment, the improvement comprising:

a. supporting the permionic membrane by maintaining the anode in contact therewith on one side thereof and maintaining the cathode in contact therewith on the opposite side thereof whereby to enable the permionic membrane to withstand a pressure differential of at least 1 pound per square inch;

b. maintaining a superatmospheric pressure in the anolyte compartment, whereby to maintain the chlorine at a superatmospheric partial pressure above 200 pounds per square inch gauge;

c. withdrawing gaseous chlorine from the anolyte compartment at a superatmospheric partial pressure; and

d. cooling, without compression, the superatmospheric pressure gaseous chlorine below the boiling temperature corresponding to the partial pressure thereof, whereby to condense chlorine.

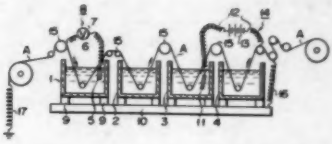
---

**4,370,210**

## METHOD AND APPARATUS FOR CONTINUOUSLY FORMING COLOR DISPLAY LAYER ON STAINLESS STEEL STRIP

**Tsuyoshi Yoshihara, Sanjo, and Nobuaki Ohashi, Niiza, both of Japan, assignors to Nippon Kinzoku Co., Ltd., Tokyo, Japan**

**Filed Mar. 10, 1981, Ser. No. 242,165**
**Int. Cl.³ C23F** *5/02*
**U.S. Cl. 204—140** **5 Claims**



1. A method of continuously forming a color display layer on the surface of a stainless steel strip by immersing the strip in an oxidizing solution comprising:

tentatively immersing a stainless steel strip continuously in an oxidizing solution in a tank for forming a color display layer on the surface of strip which is electrically insulated from the tank, thereby allowing to generate an electrical potential difference between the strip and the tank, and measuring first the relationship between the thickness or color tone of the color display layer and the potential difference between strip immersed in the oxidizing solution and a reference electrode; and

continuously immersing the same kind of stainless steel strip in said oxidizing solution for forming a color display layer on the surface of said strip, the difference in thickness between the actually formed color display layer and a desired color display layer being converted to the difference in potential difference on the basis of the relationship measured first, and the immersion time of strip in the oxidizing solution being controlled on the basis of said difference in potential difference.

5. The method according to claim 1, wherein the stainless steel strip is further introduced into a hardening solution after being rinsed, and a power source is provided between the strip and an electrode immersed in the hardening solution thereby providing an electrical circuit which is substantially electrically separated from the electrical circuit in the oxidizing solution for measuring the potential difference.

---

**4,370,211**

## METHOD AND APPARATUS FOR CATHODIC PROTECTION

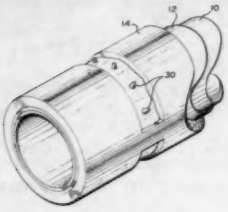
**Ludmila Hybler, Hemel Hempstead, England, assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Sep. 23, 1980, Ser. No. 190,003**
**Int. Cl.³ C23F** *13/00;* **C25B** *11/02, 11/04*
**U.S. Cl. 204—148** **36 Claims**

25. A method comprising:

oxidizing in a corrosive environment a sacrificial anode comprising a solid body of a sacrificial anode metal having a first surface and an opposing second surface, the second surface being in contact with the corrosive environment,

and further comprising a plurality of means for visual or tactile determination of the extent of corrosion of the anode metal, said means comprising radial projections of a relatively non-corrosive material, the radial projections being at least partially encased in the anode material so as




to be increasingly exposed as the second surface of the sacrificial anode is corroded, and

determining the extent of corrosion of the anode metal by visual or tactile inspection of the portion of the radial projections extending outward from the second surface.

---

**4,370,212**

**ELASTOMERIC FILM**

**Tibor G. Mahr, and Pallatheri M. Subramanian, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 1, 1981, Ser. No. 259,422**

**Int. Cl.³ C08F *8/12, 8/42***

**U.S. Cl. 204—159.14** **20 Claims**

1. A process for treating ethylene/vinyl acetate copolymer (EVA) comprising:

(a) providing an EVA copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight, said film being crosslinked as a result of being subjected to a 0.5 to 16 megarad dosage of high energy radiation; and

(b) converting greater than about 50 percent of the acetate groups in the film to hydroxyl groups to a depth in the film of 0.5 microns, while converting less than 50 percent of the acetate groups at depths greater than 0.5 microns; and

(c) contacting the resulting film with an at least 3 percent finely divided mineral slurry.

4. A process for treating ethylene/vinyl acetate copolymer comprising:

(a) providing an EVA copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight, said film being crosslinked as a result of being subjected to a 0.5 to 16 megarad dosage of high energy radiation; and

(b) converting greater than about 50 percent of the acetate groups in the film to hydroxyl groups to a depth in the film of 0.5 microns, while converting less than 50 percent of the acetate groups to depths greater than 0.5 microns;

(c) attaching a coupling agent selected from the group consisting of silane coupling agents, ionic hydrocarbon copolymers and titanate coupling agents to the surface of the film by treating the film with a 1–5 percent solution of the coupling agent in an organic solvent; and

(d) attaching finely divided mineral particulates to the coupling agent by treating the film to an at least 3 percent mineral slurry.

7. A process for treating ethylene/vinyl acetate copolymer (EVA) comprising:

(a) providing an EVA copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight, said film being crosslinked as a result of being subjected to a 0.5 to 16 megarad dosage of high energy radiation; and

(b) converting greater than 50 percent of the acetate groups in the film to hydroxyl groups to a depth in the film of 0.5 microns, while converting less than 50 percent of the acetate groups at depths greater than 0.5 microns; and

(c) treating the film with a solution of 5–40 percent ionic hydrocarbon copolymer in an at least 3 percent aqueous finely divided mineral slurry.

10. A process for treating ethylene/vinyl acetate copolymer (EVA) comprising:

(a) providing an EVA copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight, said film being crosslinked as a result of being subjected to a 0.5 to 16 megarad dosage of high energy radiation; and

(b) converting greater than 50 percent of the acetate groups in the film to hydroxyl groups to a depth in the film of 0.5 microns, while converting less than 50 percent of the acetate groups at depths greater than 0.5 microns; and

(c) treating the film with an at least 3 percent finely divided mineral slurry wherein the finely divided mineral particulates are coated with a coupling agent selected from the group consisting of silane coupling agents, titanate coupling agents, and ionic hydrocarbon copolymers.

---

**4,370,213**

**OXYGEN SENSOR**

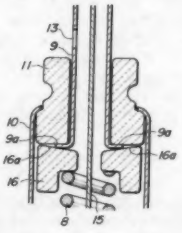
**Shuichiro Oki, Aichi, and Tetsuo Watanabe, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan**

**Filed May 18, 1981, Ser. No. 264,240**

**Claims priority, application Japan, May 29, 1980, 55/73112[U]**

**Int. Cl.³ G01N *27/46***

**U.S. Cl. 204—195 S** **3 Claims**




1. In an oxygen sensor, wherein a solid electrolyte consisting of a tubular body closed at its one end and having inner and outer electrodes formed on its inner and outer surfaces respectively is gastightly received in a housing, a center conductor is pressed against the inner electrode by a pressing force of a spring connected to said center conductor, a tubular connecting terminal is electrically connected to said center conductor by a second conductor, and a metallic container receives a portion of an open end of said tubular body and said center conductor,

the improvement comprising:

a first insulating body supported by the upper end of said metallic container;

said tubular connecting terminal having an outwardly extending rim formed at an end portion thereof and penetrating through said first insulating body;

said spring being slidable with respect to said metallic container; and

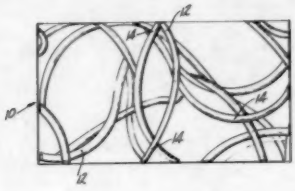
a second insulating body being arranged between said rim and said spring and being axially slidable.

4,370,214

## RETICULATE ELECTRODE FOR ELECTROLYTIC CELLS

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 25, 1980, Ser. No. 143,970
Int. Cl.³ C25B 11/03, 11/04; H01M 4/90, 4/80
U.S. Cl. 204—242 11 Claims




1. A reticulate electrode for use in the electrolysis of aqueous solutions of ionizable compounds which comprises a network of electroconductive metal coated filaments, said filaments being selected from plastics of the group consisting of polyarylene sulfides, polyolefins produced from olefins having 2 to about 6 carbon atoms and their chloro- and fluoro- derivatives, nylon, melamine, acrylonitrile-butadiene-styrene (ABS), and mixtures thereof, said network having interfilament bonding at contact sites between adjacent filaments, and said reticulate electrode having a porosity of at least 90 percent.

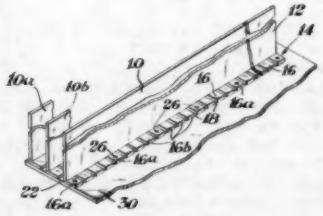
---

4,370,215

## RENEWABLE ELECTRODE ASSEMBLY

Francis D. Frudd, Fairport, N.Y., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 29, 1981, Ser. No. 229,617
Int. Cl.³ C25B 9/00, 11/02; B23K 31/00; B23P 19/00
U.S. Cl. 204—242 12 Claims




1. A renewable electrode assembly comprising:
(1) a support;
(2) an electrode body; and
(3) a flange extending from one edge of the electrode body and fastened to the support; said flange having a plurality of tabs, at least one of said tabs being fastened to the support and separable from the electrode body; and at least one tab not being fastened to said support.

4. The electrode assembly of claim 1 or 3 wherein the electrode assembly forms part of an electrolytic cell and the electrode body forms an anode extending into an electrolyte.

4,370,216

## ELECTROLYTIC CELL AND ANODE FOR MOLTEN SALT ELECTROLYSIS

Stanley F. Spangenberg; Arlington L. Finley, both of Midland, and D. James Searson, Sanford, all of, MI, assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 6, 1980, Ser. No. 204,733
Int. Cl.³ C25C 3/04, 3/06
U.S. Cl. 204—243 R 9 Claims

1. An electrode for the electrolysis of molten salts comprising:
(a) an uncoated, uncatalyzed hollow ceramic member which comprises a single phase material of an oxide of titanium and a dopant suited to prevent at least a portion of titanium ions having a formal valence of +3 from converting to titanium ions having a formal valence of +4; and
(b) an electrically conductive substance occupying at least a portion of the interior of the hollow ceramic member and adapted to transfer electrical energy from a power source to the ceramic member.

---

4,370,217

## TARGET ASSEMBLY COMPRISING, FOR USE IN A MAGNETRON-TYPE SPUTTERING DEVICE, A MAGNETIC TARGET PLATE AND PERMANENT MAGNET PIECES

Hidefumi Funaki, Fuchu, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,778
Claims priority, application Japan, Jun. 16, 1980, 55/80221
Int. Cl.³ C23C 15/00
U.S. Cl. 204—298 11 Claims

1. In a target assembly comprising a target plate, a permanent magnet member, and a conductive body, said target plate being of a predetermined material and having a first and a second principal surface, said conductive body being brought into contact with said second principal surface, said target assembly being for use in a hollow space of a device comprising means for holding at least one object in said hollow space with said object facing said first principal surface, an electrode exposed to said hollow space, and means for supplying an electric voltage between said conductive body and said electrode to produce an electric field, said permanent magnet member being for producing a magnetic field intersecting said electric field, said device being for sputtering said predetermined material primarily from said first principal surface onto said object by the help of said electric and said magnetic fields, the improvement wherein:
said predetermined material is a magnetic material;
said permanent magnet member comprising first and second permanent magnet pieces, each having a north and a south pole, said first and said second permanent magnet pieces being brought into contact with said target plate with differently named poles of the respective magnet pieces placed nearer to said target plate.

---

4,370,218

## INORGANIC SALT OXIDATION PROMOTERS FOR HYDROCARBONS

Donald D. Carlos, Louisville, Ky., assignor to Ashland Petroleum Company, division of Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 20, 1981, Ser. No. 245,801
Int. Cl.³ C07C 27/10, 27/12; C10G 3/00
U.S. Cl. 208—3 18 Claims

1. A process for oxidizing liquid saturated hydrocarbons primarily containing petrolatums and waxes, said hydrocarbons containing an average of about 20 to about 100 carbon atoms per molecule comprising blowing an oxidizing gas through a liquid mass of said hydrocarbons under a pressure of about 50 to 400 psia in the presence of an oxidation promoting amount of an inorganic salt, the anion of which consists of one or more phosphorous, nitrogen, sulfur, silicon or halogen

atoms and one or more oxygen atoms to yield an oxidized hydrocarbon product having an acid number of at least 9.8.

---

4,370,219

## HYDROCARBON CONVERSION PROCESS EMPLOYING ESSENTIALLY ALUMINA-FREE ZEOLITES

**Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Mar. 16, 1981, Ser. No. 244,471**
**Int. Cl.³ C10G *47/16, 69/04, 69/12, 11/05***
**U.S. Cl. 208—59** **24 Claims**

1. A process for converting a hydrocarbonaceous feedstock by subjecting the feedstock to catalytic reactions in three zones, the process comprising the steps of catalytically hydroprocessing the feedstock in a first reaction zone, contacting the product of the first zone in a second reaction zone under cracking conditions including a temperature of from about 650°–1100° F., a pressure of from about 0–2000 psig and an LHSV of from about 0.1–10 with a first catalyst comprising an essentially alumina-free intermediate pore size zeolite and, immediately thereafter, contacting the product of the second reaction zone in a third reaction zone with a second catalyst comprising an essentially alumina-free intermediate pore size zeolite under cracking conditions less severe than the cracking conditions in the second reaction zone including a temperature of from about 400°–700° F., a pressure of from about 0–2000 psig and an LHSV of from about 0.1–10 wherein the less severe cracking conditions are obtained by maintaining a lower temperature in the third reaction zone than in the second reaction zone so as to favor polymerization in the third zone of olefins formed in the second zone whereby selectivity to $C_5^+$ is increased.

---

4,370,220

## PROCESS FOR REDUCING COKE FORMATION IN HEAVY FEED CATALYTIC CRACKING

**Roby Bearden, and Gordon F. Stuntz, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.**

**Continuation-in-part of Ser. No. 259,830, May 4, 1981, which is a continuation-in-part of Ser. No. 108,396, Dec. 31, 1979, Pat. No. 4,280,896. This application Jul. 22, 1981, Ser. No. 285,817**
**Int. Cl.³ C10G *9/16, 11/18***
**U.S. Cl. 208—108** **14 Claims**

1. A method for passivating a hydrocarbon cracking catalyst utilized to crack hydrocarbon feedstock to lower molecular weight products in the reaction zone of a catalytic cracking system comprising a reaction zone and a regeneration zone, where the feedstock contains at least one metal contaminant selected from the class consisting of nickel, vanadium, and iron, and where at least some of said metal contaminant becomes deposited on the catalyst such that at least a major portion of the total of said metal contaminants deposited on the catalyst comprises only one of said metal contaminants,

and where said metal contaminant contributes to excessive hydrogen and coke production, the method comprising:

A. monitoring the composition of said metal contaminant deposited on the catalyst;

B. adding an effective passivating amount of at least one of said metal contaminants not present as the major contaminant on the catalyst; and

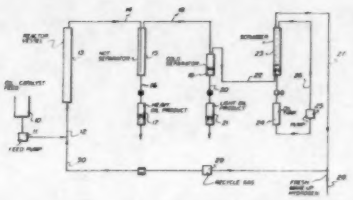
C. passing catalyst from the reaction zone through a regeneration zone maintained under net reducing conditions and through a reduction zone maintained at an elevated temperature for a time sufficient to at least partially passivate said metal contaminants on the catalyst and thereby minimize excessive hydrogen and coke production, while a reducing environment is maintained in said reduction zone by the addition to the reduction zone of a material selected from the class consisting of hydrogen, carbon monoxide and mixtures thereof.

4,370,221

## CATALYTIC HYDROCRACKING OF HEAVY OILS

**David J. Patmore; Ramaswami Ranganathan; Chandra P. Khulbe, all of Ottawa, and Barry B. Pruden, Calgary, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ontario, Canada**

**Filed Mar. 3, 1981, Ser. No. 240,089**
**Int. Cl.³ C10G *47/04***
**U.S. Cl. 208—112** **7 Claims**



1. A process for hydrocracking a heavy hydrocarbon oil, at least 50 wt. % of which boils above 524° C. which comprises:

(a) passing a slurry of said heavy hydrocarbon oil and 0.01–5 wt. % of a catalyst comprising finely divided sub-bituminous coal carrying cobalt and molybdenum compounds in amounts of 0.2 to 10 wt. % Co and 0.4 and 20 wt. % Mo in the presence of 500–50,000 scf of hydrogen per barrel of said hydrocarbon oil upwardly through a tubular hydrocracking zone, said hydrocracking zone being maintained at a temperature between about 400° and 500° C., a pressure above 500 psig. and a space velocity between about 0.5 and 4.0 volumes of heavy hydrocarbon oil per hour per volume of hydrocracking zone capacity,

(b) removing from said hydrocracking zone a mixed effluent containing a gaseous phase comprising hydrogen and vaporous hydrocarbons and a liquid phase comprising heavy hydrocarbons, and

(c) separating said effluent into a gaseous stream containing hydrogen and vaporous hydrocarbons and a liquid stream containing heavy hydrocarbons.

---

4,370,222

## FCC REGENERATION

**Stephen J. McGovern, Deptford, and John H. Yeigh, Jr., Turnersville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Mar. 2, 1981, Ser. No. 239,776**
**Int. Cl.³ C10G *11/18***
**U.S. Cl. 208—113** **6 Claims**

1. In a fluidized catalytic cracking process of the type wherein a hydrocarbon feedstock is contacted with cracking catalyst in a reactor vessel under catalytic cracking conditions producing cracked hydrocarbon vapors and coke-contaminated catalyst and wherein said coke-contaminated catalyst is regenerated in a regenerator vessel at a predetermined elevated temperature with air, utilized as a molecular oxygen-containing regeneration gas, passing through said regenerator vessel at a predetermined superficial velocity producing regenerated catalyst and a flue gas comprising oxides of carbon, the improvement which comprises:

(a) introducing oxygen-enriched air into the regenerator vessel as the molecular oxygen-containing regeneration gas,

(b) passing said oxygen-enriched air through said regenerator vessel at substantially the said predetermined superficial velocity, whereby the predetermined elevated temperature in the regenerator vessel is increased, and

(c) cooling at least a portion of the regenerated catalyst from the increased elevated temperature to provide the regen-

erated catalyst at substantially the said predetermined elevated temperature.

---

**4,370,223**

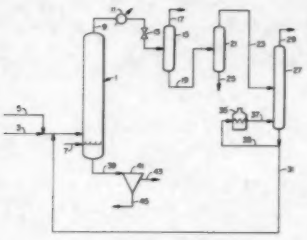
## COKING HYDROCARBONACEOUS OILS WITH AN AQUEOUS LIQUID

**Phillip R. Bose, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Continuation-in-part of Ser. No. 221,758, Dec. 31, 1980, abandoned. This application Nov. 24, 1981, Ser. No. 324,216**

**Int. Cl.³ C10G *9/26***

**U.S. Cl. 208—125** **5 Claims**



1. A process for producing coke from a hydrocarbonaceous oil which comprises:

forming coke by contacting said oil with free oxygen in the presence of an aqueous liquid at a temperature of at least 300° C. and a pressure sufficient to maintain said aqueous liquid at least partially in the liquid phase.

---

**4,370,224**

## REFORMING WITH MULTIMETALLIC CATALYSTS

**Paul E. Eberly, Jr.; Charles H. Mauldin, and William C. Baird, Jr., all of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.**

**Division of Ser. No. 211,765, Dec. 1, 1980, which is a continuation-in-part of Ser. No. 53,375, Jun. 29, 1979, Pat. No. 4,265,786. This application Nov. 2, 1981, Ser. No. 317,116**

**The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.**

**Int. Cl.³ C10G *35/085***

**U.S. Cl. 208—139** **9 Claims**

1. A process for reforming a hydrocarbon feed at reforming conditions which comprises contacting said feed with a catalyst which comprises from about 0.1 to about 2 percent platinum, from about 0.1 to about 2 percent iridium, from about 0.01 to about 0.1 percent copper, from about 0.001 to about 3 percent selenium, and from about 0.1 to about 2.5 percent halogen, composited with an inorganic oxide support.

---

**4,370,225**

## DRY MAGNETIC SEPARATORS FOR INCREASED RECOVERY OR ORE AT HIGH BELT SPEEDS

**John P. Bingel, Lander, Wyo., and Robert W. Salmi, Grand Rapids, Minn., assignors to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Aug. 24, 1981, Ser. No. 295,895**

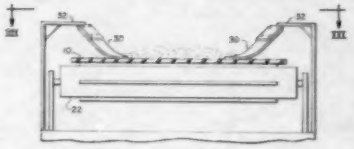
**Int. Cl.³ B03C *1/16, 1/30***

**U.S. Cl. 209—40** **3 Claims**

1. In magnetic ore particles separating apparatus, said apparatus including belt conveyor means, said conveyor including at least one endless belt loop, a head-pulley mounted within said loop at one end thereof, said pulley having magnet means for attracting said ore particles, means for driving said conveyor, and a splitter device located downwardly from said head-pulley and aligned outwardly of said loop so as to effect separation of particles by differences in trajectory and magnetic susceptibility when thrown off the head-pulley end of said loop,

the improvement in said apparatus which comprises:

means for periodically striking said conveyor at at least one location of an upper flight of said belt intermediate said head-pulley and an opposite end thereof so as to effect stratification of said particles by size prior to their arrival at said head-pulley-end



means for regulating the width of the layer of ore particles on said conveyor, said width tapering outwardly toward the side edges of said conveyor means in the direction toward the head-pulley,

whereby, a thin layer of particles stratified by size is obtained at the head-pulley end of said conveyor, thus improving separation of magnetic from non-magnetic particles by differences in the trajectory and magnetic susceptibility thereof.

---

**4,370,226**

## SIFTING MACHINE

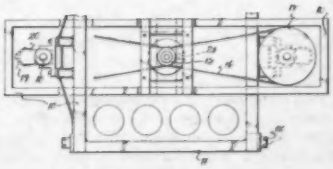
**Richard Fullalove, Denton, England, assignor to Henry Simon Limited, Cheshire, England**

**Filed Feb. 25, 1981, Ser. No. 238,100**

**Claims priority, application United Kingdom, Mar. 12, 1980, 8008360**

**Int. Cl.³ B07B *1/38***

**U.S. Cl. 209—332** **1 Claim**

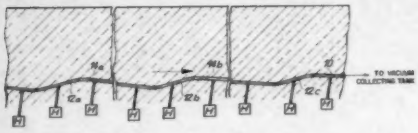


1. A sifting machine comprising a freely suspended sieve box, a motor attached thereto and drivingly connected to at least one rotatable shaft also attached to the sieve box and carrying a throwing weight to impart a sifting motion thereto, said throwing weight being located outside the bounds of the sieve box with the effective mass of said throwing weight being distributed evenly above and below a horizontal plane passing through the centre of gravity of the sieve box, and with an additional throwing weight being mounted for rotation about the central vertical axis of said sieve box.

## 4,370,227
## VACUUM DRAIN FACILITY

**Harald R. Michael, Hamburg, Fed. Rep. of Germany, assignor to Electrolux GmbH, Hamburg, Fed. Rep. of Germany**

**Continuation of Ser. No. 54,921, Jul. 5, 1979, abandoned, which is a continuation of Ser. No. 832,812, Sep. 13, 1977, abandoned.**
**This application Aug. 19, 1980, Ser. No. 179,473**
**Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641110**
**Int. Cl.³ C02F *1/00***
**U.S. Cl. 210—170** **7 Claims**



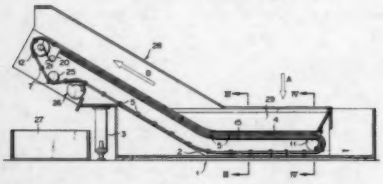

1. In a vacuum drain sewage facility comprising a vacuum conduit connected to a collecting tank that is maintained under vacuum so as to move liquid therethrough without requiring a gravity flow layout, a plurality of house connection means to said vacuum conduit for admitting to the conduit relatively small amounts of collected liquid followed immediately by air in the amount of 2 to 15 times the liquid volumes, said conduit presenting ascending and descending sections, the improvement comprising means for counteracting intermittent wrong-way flow in said conduit, said counteracting means comprising an arrangement wherein the vacuum conduit in the vicinity of the house connections is laid out in the direction of flow with alternating relatively short ascending sections and relatively long descending sections at least twice as long as the ascending sections.

---

## 4,370,228
## MAGNETIC BELT CONVEYOR TYPE MAGNETIC PARTICLE SEPARATOR

**Minoru Tashiro, and Takaaki Uemura, both of Tokyo, Japan, assignors to Bunri Industry Co., Ltd., Tokyo, Japan**

**Filed Oct. 30, 1981, Ser. No. 316,940**
**Claims priority, application Japan, Nov. 12, 1980, 55-159294**
**Int. Cl.³ B01D *35/06***
**U.S. Cl. 210—223** **10 Claims**



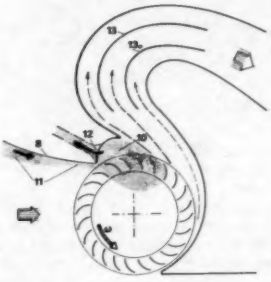
1. In a magnetic belt conveyor type magnetic particle separator comprising a storage tank for storing liquid charged thereto and containing magnetic particles, an endless belt conveyor having one end portion extending in said storage tank and the other end portion extending sidewise from said storage tank in an upwardly inclined direction, and magnet means disposed beneath the forward run of said belt conveyor to extend in the direction of running of said belt conveyor, wherein magnetic particles contained in said liquid are attracted to the upper surface of the forward run of said belt conveyor by the magnetic forces of said magnet means to be conveyed in the state attracted to the belt conveyor up to the forward run end thereof and separated therefrom at said forward run end for being discharged, thereby separating magnetic particles from said liquid; the improvement which further comprises scrapers mounted on the inner side of said belt conveyor in a spaced-apart relation in the direction of running of the belt conveyor and moved in unison therewith over the upper surface of said magnet means to scrape magnetic particles off the upper surface of the magnet means, and protuberances projecting from the outer surfaces of the belt conveyor to catch masses of magnetic particles rolling over the belt conveyor.

---

## 4,370,229
## HIGH CAPACITY OIL RECUPERATOR FOR DE-POLLUTION IN ROUGH WATERS

**André E. Grihangne, 186, Avenue Victor Hugo, Paris, France (75116)**

**Filed Apr. 28, 1981, Ser. No. 258,393**
**Claims priority, application France, May 8, 1980, 80 10234**
**Int. Cl.³ E02B *15/04***
**U.S. Cl. 210—242.3** **2 Claims**



1. A high capacity oil slick recuperator for use in rough waters, comprising:

a stator having an inlet, a rotor rotatable inside said stator and provided with vanes, which rotor sucks in polluted water perpendicularly to its axis of rotation, wherein the stator-rotor assembly is adapted to be entirely submerged and wherein the configuration of the stator generates and maintains, by interaction between stator and rotor, a stream which induces a vortex stabilized in all azimuths on the periphery of the rotor and which is not associated with the general flow of the water stream, the axis of said vortex being parallel to the axis of the rotor and its intensity being dependent on the speed of rotation of the rotor; and wherein the oil slick on the water surface is carried as far as the vortex by the water stream being guided in submersion along a wall extending forward from the stator inlet and intercepting the water surface, and wherein the oil, which is less dense than the water, is caught into said vortex wherefrom it is sucked up as it enters it, via pumping means, towards a storage, the axis of the rotor being substantially horizontal, the said rotor being constituted by a grid of identical vanes arranged in cylindrical form at its periphery and in parallel to its axis of rotation, the upper inside wall profile of the stator being provided close to the periphery of the rotor with a cuspidal edge parallel to the vanes of the rotor and creating with the latter a small gap, the said cuspidal edge ensuring the separation between the incoming and outgoing water streams; the profile of said wall downstream of the said edge being substantially akin to the flow boundary line of said induced vortex, the said profile forming a crook which localizes said vortex; the oil pumping means being located in the vortex and constituted by a parietal intake provided in a concave nose-piece of the crook of the stator and which communicates with an induction pipe of a pump which transfers recuperated oil to the storage.

4,370,230

## DRAINPIPE FOR A REVERSIBLE DRAINPIPE FILTER SYSTEM

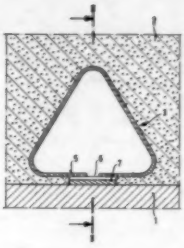
Josef Tylmann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 30, 1981, Ser. No. 259,187

Claims priority, application Switzerland, May 12, 1980, 3695/80

Int. Cl.³ B01D 23/20

U.S. Cl. 210—289 5 Claims



5. A reversible filter system for water treatment comprising:

a filter basin having a bottom;

a filter bed of uniform grain size received on said filter basin bottom;

a collecting main extending below said basin along a symmetrical vertical plane;

a plurality of drainpipes mounted within said basin, on said bottom in perpendicular relation to said vertical plane, each said drainpipe being of triangular cross-section and having at least one elongated slot in a surface thereof facing said bottom and an opening in said surface offset from a midpoint of said drainpipe;

a plurality of immersion tubes, each said tube being connected with an opening in a respective drainpipe and extending into said collecting main; and

a plurality of ledges on said bottom, each said ledge supporting a respective drainpipe thereon and having a plurality of upstanding webs and grooves disposed in alternating relation and in facing relation to said slot of a respective drainpipe.

---

4,370,231

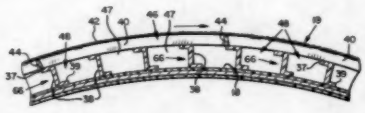
## ROTARY DRUM FILTER

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

Filed Sep. 4, 1981, Ser. No. 299,535

Int. Cl.³ B01D 33/06

U.S. Cl. 210—404 21 Claims



1. A deck structure for a filtering apparatus including a rotatably mounted, generally cylindrical drum with filtering means and vacuum drainage means associated therewith, wherein said deck structure comprises:

a plurality of circumferentially spaced, axially extending, and radially projecting imperforate channel members affixed to the outer peripheral surface of the drum, said channel members each including a first circumferentially extending surface which is radially spaced from the peripheral surface of the drum, said first surfaces defining filtrate slots which are at least about as wide in a circumferential direction as said first surfaces;

a plurality of axially extending, evenly circumferentially spaced dams mounted adjacent the outer periphery of at least some of said channel members, said dams defining filtrate compartments and subcompartments therebetween which lead to the vacuum drainage means; and

perforate support means for supporting the filtering means above said filtrate compartments.

12. A rotary drum type filtering apparatus adapted to be partially submerged in a tank filled with pulp slurry, wherein the apparatus comprises:

a generally cylindrical, rotatably mounted drum;

a plurality of circumferentially spaced, axially extending, imperforate channel members mounted to the outer peripheral surface of said drum to define a plurality of filtrate subcompartments, said channel members each including a first circumferentially extending surface which is radially spaced from said peripheral surface of said drum, said first surfaces defining filtrate slots therebetween;

a plurality of axially extending dams mounted adjacent the outer periphery of at least some, but fewer than all, of said channel members to define a plurality of filtrate compartments of substantially equal size;

said filtrate slots being at least about one-half of the width, in a circumferential direction, of each said filtrate subcompartment;

perforate filtering means surrounding said drum disposed outwardly of said filtrate compartments for filtering the slurry as it enters said drum;

perforate support means disposed between said filtrate subcompartments and said filtering means, for supporting said filtering means above said filtrate compartments; and

suction drainage means for creating a suction within said drum to draw the filtrate through said filtering means and into said filtrate compartments and subcompartments, and to drain the filtrate therefrom.

---

4,370,232

## SLUDGE DE-WATERING PLANT WITH A PLURALITY OF FILTER PRESSES CONNECTED IN PARALLEL

Oswald Busse, and Hugo Klesper, both of Aarbergen, Fed. Rep. of Germany, assignors to Passavant-Werke AG & Co. KG, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,804

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1980, 3029438

Int. Cl.³ B01D 25/12

U.S. Cl. 210—224 8 Claims

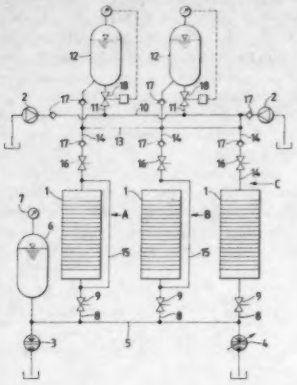
1. A sludge de-watering plant having a plurality of filter presses connected in parallel with at least one low-pressure pump delivering a high rate of sludge and serving substantially for rapid filling of the presses, and at least one high-pressure pump substantially effecting the filtration, the improvement comprising:

(a) at least two low-pressure pumps and at least two high-pressure pumps,

(b) a first pipe system associated with each of said low-pressure pumps and a second pipe system associated with each of said high-pressure pumps,

(c) means connecting said first and second pipe systems to the individual filter presses for mutually independent delivery,

(d) at least one pressure compensation reservoir tank in each of said first and second pipe systems, and



(e) means for mutually controlling the pumps in said first and second pipe systems independently by the relevant pressure prevailing in the pipe systems.

---

**4,370,233**

**CHEMICAL DETOXIFICATION OF SEWAGE SLUDGE**

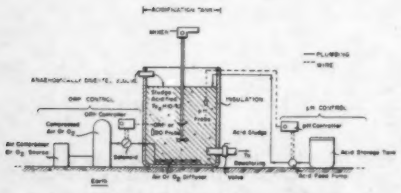
**Thomas D. Hayes, Columbus, Ohio; Randolph M. Kabrick, and William J. Jewell, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.**

**Filed Jul. 10, 1981, Ser. No. 281,950**

**The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.**

**Int. Cl.³ C02F *11/02, 11/12***

**U.S. Cl. 210—609** **9 Claims**



1. A method for the chemical detoxification of anaerobically digested organic sludge, which sludge contains toxic heavy metals in insoluble form, comprising the sequential steps of:

(a) introducing a quantity of anaerobically digested sludge into an insulated acid-resistant reaction vessel, said sludge having a temperature of from about 30° C. to 60° C.;

(b) mixing and aerating said sludge at a rate sufficient to increase the oxidation reduction potential to above +300 mv.;

(c) maintaining said increased oxidation reduction potential for a period of 6–12 hours, thereby to convert the heavy metals within the sludge to a desired oxidation state;

(d) adding to said sludge a quantity of concentrated acid in an amount sufficient to acidify said sludge to a pH of from about 1.0 to about 3.0 for an acidification period of 6 to 12 hours while maintaining said oxidization reduction potential at a level greater than +300 mv., thereby to convert the oxidized heavy metals to their soluble species; and

(e) dewatering the acidified sludge to remove the solubilized heavy metals therefrom, thereby to produce dewatered, detoxified acidic sludge and acidic, heavy-metal-containing water.

---

**4,370,234**

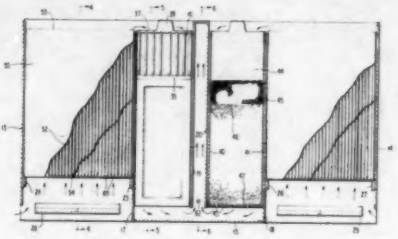
**SYSTEM AND METHOD FOR REMOVING AMMONIA FROM WASTEWATER**

**William P. Marsland, R.R. 3, Box 166, Spring Hill, Kans. 66083**

**Filed Feb. 5, 1981, Ser. No. 231,833**

**Int. Cl.³ C02F *1/42, 3/08***

**U.S. Cl. 210—617** **28 Claims**



1. A method of treating wastewater containing ammonium comprising:

providing a biological filter containing nitrifying bacteria;

providing a bed of ion exchange particles downstream of said biological filter as a substrate for nitrifying bacteria, said ion exchange particles having ammonium exchange properties;

contacting said wastewater with said biological filter;

contacting the resulting bacteria-treated wastewater with said ion-exchange particles under conditions whereby ammonium is transferred from said wastewater to said particles and is converted to an oxygen-containing nitrogen compound.

---

**4,370,235**

**METHOD OF TREATING EXCESS SLUDGE**

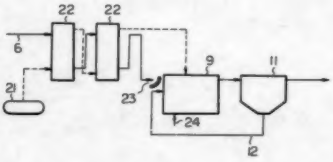
**Akira Suzuki, Saitama, and Yosumi Shioya, Higashi Kurume, both of Japan, assignors to Shinryo Air Conditioning Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 43,757, May 30, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,148**

**Claims priority, application Japan, Jul. 4, 1978, 53-81301**

**Int. Cl.³ C02F *1/78***

**U.S. Cl. 210—620** **2 Claims**



1. A method of treating all excess activated sludge discharged from an activated sludge treatment process, comprising:

passing all of said excess sludge obtained from said process, none of which is to be returned to said activated sludge treating process, to a conversion unit;

converting therein the cells of microorganisms in the suspended solids in said excess sludge to an organic liquid by ozonization of the excess sludge;

passing the resulting organic liquid to a digesting stage in

which activated sludge utilizes the organic liquid as a nutrient;

aerobically digesting the organic liquid; and

discharging the effluent from the digesting stage.

---

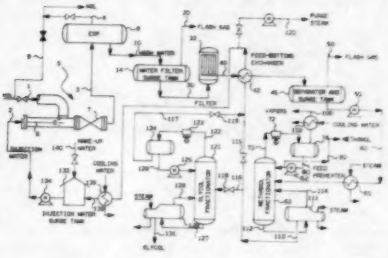
## 4,370,236
## PURIFICATION OF HYDROCARBON STREAMS

**Robert C. Ferguson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Dec. 16, 1980, Ser. No. 217,068**

**Int. Cl.³ B01D *11/04***

**U.S. Cl. 210—634** **15 Claims**



1. Process comprising:

(a) contacting a liquid stream comprising hydrocarbon as its major component and particulate and at least one contaminant selected from the group consisting of hydrogen sulfide, carbon dioxide, methanol, ethylene glycol, and amine as its minor component with an aqueous wash liquid stream comprising water as its major component to form a mixture comprising liquid hydrocarbon, aqueous wash liquid and particulate;

(b) withdrawing from said mixture a purified liquid hydrocarbon stream and a wash stream comprising water, particulate, and at least one contaminant selected from the group consisting of hydrogen sulfide, carbon dioxide, methanol, ethylene glycol and amine;

(c) filtering at least a portion of the particulate from the wash stream to form a filtered wash stream; and

(d) recycling at least a portion of the filtered wash stream to the aqueous wash liquid stream whereby the aqueous wash liquid stream contains at least one contaminant selected from the group consisting of hydrogen sulfide, carbon dioxide, methanol, ehtylene glycol and amine as a minor component.

12. Apparatus comprising:

an electrostatic precipitator;

a filter;

a first conduit emptying into said electrostatic precipitator;

a first means for defining a flow path from a lower portion of the electrostatic precipitator to the filter; and

a second means for defining a flow path between the filter and the first conduit comprising:

a methanol fractionator;

a third means for defining a flow path between the filter and the methanol fractionator; and

a fourth means for defining a flow path from a lower portion of the methanol fractionator to the first conduit.

## 4,370,237
## EXTRACTANTS

**Richard J. Dain, Crouch, near Borough Green; Gary D. Manning, Welwyn Garden City, and Alfred R. Burkin, Shenfield, all of England, assignors to Ford & Dain Research Limited, Sevenoaks, England**

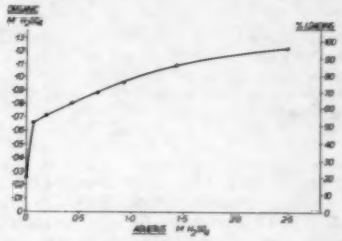
**PCT No. PCT/GB79/00171, § 371 Date May 21, 1980, § 102(e) Date May 21, 1980, PCT Pub. No. WO80/00796, PCT Pub. Date May 1, 1980**

**PCT Filed Oct. 25, 1979, Ser. No. 193,280**

**Claims priority, application United Kingdom, Oct. 27, 1978, 42255/78**

**Int. Cl.³ B01D *11/04***

**U.S. Cl. 210—638** **18 Claims**



1. In an extraction process for extracting ionic values from an aqueous solution containing same, said process comprising first contacting said aqueous solution with an organic hydrophobic liquid extractant phase comprising an extractant for said ions to form a loaded extractant phase, and thereafter stripping said ions from said loaded extractant phase with an aqueous stripping liquid phase, the improvement comprising using, as said extractant, an at least substantially water-insoluble extractant, the molecules of which contain at least one hydrophobic group selected from the group consisting of cyclic phosphazene radicals, linear siloxane radicals, cyclic siloxane radicals, and three-dimensional siloxane radicals.

---

## 4,370,238
## PROCESS FOR DRYING SURFACTANT-CONTAINING CRUDE OIL

**James E. Tackett, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio**

**Filed May 14, 1979, Ser. No. 38,964**

**Int. Cl.³ C10G *33/04***

**U.S. Cl. 210—639** **28 Claims**

1. A process for the removal of surfactant from a surfactant produced crude oil comprising drying the micellar produced crude oil to a water content of less than about 10%, and thereafter extracting the surfactant and remaining water from the surfactant produced crude oil with an alcohol selected from the group consisting of alcohols having a carbon to hydroxy group ratio of 3 or less, ethoxylated products of these alcohols and mixtures thereof wherein the alcohol contains less than about 12 percent by volume water.

---

## 4,370,239
## BISULFITE SPONGE PROCESS

**Harbo P. Jensen, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Dec. 15, 1980, Ser. No. 216,402**

**The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.**

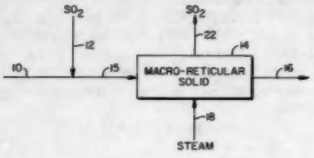
**Int. Cl.³ B01D *15/00***

**U.S. Cl. 210—668** **6 Claims**

1. A method for removing sulfite ions from an aqueous liquid comprising:

converting at least a portion of said sulfite ions to bisulfite ions by decreasing the pH of said liquid;

contacting said liquid with a porous organic macroreticular solid compound having at least 0.1 milliequivalents of




adduct-forming carbonyl functional groups per gram of compound; thereby forming carbonyl adducts of said bisulfite ions and a residual liquid;

withdrawing said residual liquid from contact with said macroreticular solid compound.

---

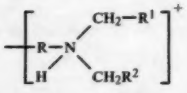
**4,370,240**

## REMOVAL OF IRON COMPOUNDS FROM ORGANIC PROCESS STREAMS

**George L. Brownell, Mt. Lebanon Township, Allegheny County; William R. Davie, Hopewell Township, Beaver County, and Marvin C. Fields, Wilkins Township, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Jun. 10, 1981, Ser. No. 272,141**
**Int. Cl.³ B01D *15/04***
**U.S. Cl. 210—673** **7 Claims**

1. Method of removing iron compounds from a phenolic composition containing up to 10% water comprising passing the phenolic composition through a bed of resin containing active sites of the general formula




where R is an inert active site connector and $R^1$ and $R^2$ are independently selected from the group consisting of H and COOH.

---

**4,370,241**

## PROCESS FOR THE DETOXIFICATION OF WASTE WATER CONTAINING PHENOL, PHENOL DERIVATIVE OR PHENOL AND FORMALDEHYDE

**Helmut Junkermann, Frankfurt, and Horst Krüger, Darmstadt, both of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany**

**Division of Ser. No. 862,760, Dec. 20, 1977. This application Nov. 27, 1979, Ser. No. 97,898**
**Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703267; Jan. 27, 1977, 2703268**
**Int. Cl.³ C02F *1/72***
**U.S. Cl. 210—759** **25 Claims**

1. A process of purifying waste water containing (1) phenol in the absence of formaldehyde, (2) a substituted phenol or (3) phenol+formaldehyde comprising treating the waste water with hydrogen peroxide in the presence of either (a) metallic iron under acid conditions and an activator which is a salt of an alkali metal, a salt of an alkaline earth metal, a zinc salt, an aluminum salt, a nickel salt or a manganese salt or is insoluble silica or (b) metallic copper and an activator which is a salt of an alkali metal, a salt of an alkaline earth metal, a zinc salt, an aluminum salt, or a manganese salt or is insoluble silica, said activator being present in an amount of 0.1 to 0.2% based on the hydrogen peroxide.

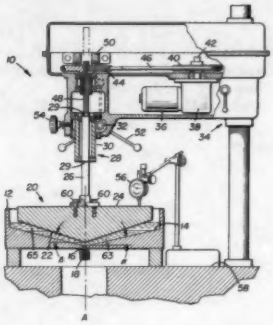
---

**4,370,242**

## DEVICE FOR AND A METHOD TO SEPARATE ORIENTABLE OR DEFORMABLE PARTICLES

**Ken A. Dill, Mountain View; Bruno H. Zimm, La Jolla, and Richard H. Shafer, Mill Valley, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.**

**Filed Oct. 3, 1980, Ser. No. 193,428**
**Int. Cl.³ B01D *43/00***
**U.S. Cl. 210—787** **16 Claims**




14. A method for separating deformable particles comprising the steps of:

placing a relatively high-density solvent in a container;

placing a rotatable member having a lower surface formed of a surface of revolution in said container;

layering a second quantity of relatively lower-density solvent containing a quantity of deformable particles on top of said relatively high-density solvent;

rotating the rotatable member slowly to create a shear force;

allowing said particles to migrate toward the center of said container;

decreasing the rate of rotation of the rotatable member;

draining off a portion of the solution through a drain located at the apex of the lower cone following a predetermined period of time of rotation.

---

**4,370,243**

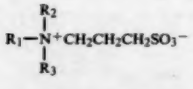
## OIL RECOVERY BY SURFACTANT-ALCOHOL WATERFLOODING

**Catherine S. H. Chen, Berkeley Heights, and Yuhshi Luh, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Feb. 9, 1981, Ser. No. 232,474**
**Int. Cl.³ E21B *43/22***
**U.S. Cl. 252—8.55 D** **12 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing in all or part of said aqueous fluid the following:

(a) a mixture of sulfobetaine of the formula




wherein $R_1$, $R_2$ and $R_3$ are hydrocarbyl groups containing 1 to 20 carbon atoms or said hydrocarbyl groups substi-

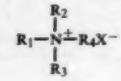
tuted with a hydroxyl group, and a preferentially oil-soluble aliphatic alcohol;

(b) an organic quaternary ammonium compound of the formula

$$(R_5)_4N^+X^-$$

wherein $R_5$ is an alkyl group containing 1 to 4 carbon atoms and X is halogen or $NO_3$; and

(c) a quaternary ammonium thickening agent of the formula



wherein $R_1$, $R_2$, $R_3$ and $R_4$ are hydrocarbyl groups containing 1 to 20 carbon atoms, at least one of which contains 16 to 20 carbon atoms and X is halogen or $NO_3$;

wherein:

(i) said mixture (a), said organic quaternary ammonium compound (b) and said thickening agent (c) are introduced into said reservoir in a single slug;

(ii) the concentration of said sulfobetaine in said slug is from about 0.25 to about 3 weight percent;

(iii) the ratio of said sulfobetaine to said alcohol is from 3:1 to 2:1,

(iv) the concentration of said thickening agent (c) in said slug is from about 0.1 to about 5 weight percent; and

(v) the concentration of said organic quaternary ammonium compound (b) in said slug is from about 0.5 to about 5 weight percent.

---

**4,370,244**

## PROCESS FOR COLD MECHANICAL WORKING OF METALLIC MATERIALS

**Harri Weinhold, Kreischa; Heinz-Rüdiger Vogel, Dresden; Bernhard Kurze, Dresden, and Gerhard Koch, Dresden, all of German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.**

**Filed Dec. 17, 1979, Ser. No. 104,160**

**Claims priority, application German Democratic Rep., Dec. 21, 1978, 210023; Dec. 21, 1978, 210025**

**Int. Cl.³ C10M 5/16**

**U.S. Cl. 252—39** **7 Claims**

1. In a process for cold mechanical treatment of metallic materials of the type in which a lubricant is used on the surface of the material to be treated or of apparatus for treating, the improvement comprising using as lubricant a liquid composition comprising an organic solvent with a boiling point below 200° C. and selected from the group consisting of benzene, monofluorotrichloromethane, monofluorodichloromethane, bromofluormethane, 1-bromo-2-fluoro-diethylene, dibromofluoromethane, monobromomonochlorodifluoromethane and trifluoroacetone, and a calcium salt of a carboxylic acid with more than 10 carbon atoms, which remains after evaporation of the solvent as a solid lubricant layer on the material.

---

**4,370,245**

## GREASE COMPOSITIONS CONTAINING QUATERNARY AMMONIUM THIOMOLYBDATES

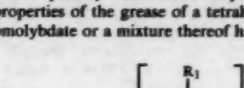
**Yumi P. Ryu, Murrysville; James R. Anglin, Gibsonia, and Gary M. Singerman, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 213,676, Dec. 5, 1980, Pat. No. 4,343,747, which is a continuation-in-part of Ser. No. 214,972, Dec. 10, 1980, Pat. No. 4,343,746. This application Dec. 24, 1980, Ser. No. 219,926**

**Int. Cl.³ C10M 1/32**

**U.S. Cl. 252—46.4** **16 Claims**

1. A grease composition comprising a hydrocarbon lubricating oil thickened to a grease with a substituted-urea thickener and a quantity sufficient to improve the extreme pressure properties of the grease of a tetrahydrocarbylammonium thiomolybdate or a mixture thereof having the formula



wherein $R_1$, $R_2$ and $R_3$ are independently selected from straight and branched alkyl and alkenyl having from one to about 30 carbon atoms, $R_4$ is selected from straight and branched alkyl or alkenyl having from about 4 to about 30 carbon atoms and benzyl, and the total number of carbon atoms in $R_1$, $R_2$, $R_3$ and $R_4$ is between about 15 and about 80 carbon atoms.

---

**4,370,246**

## ANTIOXIDANT COMBINATIONS OF MOLYBDENUM COMPLEXES AND AROMATIC AMINE COMPOUNDS

**Louis deVries, Greenbrae, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Apr. 27, 1981, Ser. No. 258,160**

**Int. Cl.³ C10M 1/32, 1/38, 1/44, 1/54**

**U.S. Cl. 252—46.4** **18 Claims**

1. A lubricating oil additive comprising a combination of

(a) an oil soluble sulfur containing molybdenum complex prepared by (1) reacting an acidic molybdenum compound and a basic nitrogen compound selected from the group consisting of a succinimide, carboxylic acid amide, Mannich base, phosphonamide, thiophosphonamide, phosphoramide, dispersant viscosity index improvers, or mixtures thereof to form a molybdenum complex wherein from 0.01 to 2 atoms of molybdenum are present per basic nitrogen atom, and (2) reacting said complex with a sulfur containing compound in an amount to provide 0.1 to 4 atoms of sulfur per atom of molybdenum, and

(b) an oil soluble aromatic amine compound or mixtures thereof, wherein the aromatic amine compound of component (b) is present in an amount of from 0.02 to 10 parts by weight per part by weight of the sulfur containing molybdenum complex of component (a).

---

**4,370,247**

## GEAR AND AXLE OIL COMPOSITION

**Marcel A. Ostyn, Bois Guillaume, France, assignor to Exxon Research and Engineering Co., Florham Park, N.J.**

**Filed Jul. 28, 1981, Ser. No. 287,869**

**Claims priority, application United Kingdom, Jul. 29, 1980, 8024774**

**Int. Cl.³ C10M 1/20, 1/26, 1/48**

**U.S. Cl. 252—46.7** **12 Claims**

1. A lubricating oil composition suitable for use as a gear oil or an axle oil comprising:

(a) from 5 to 50 mass % of mineral oil of conventional gear oil or axle oil grade;

(b) from 5 to 30 mass % in total of at least one polyoxyalkylene glycol having a viscosity of from 5 to 30 cSt at 100° C.;

(c) from 25 to 60 mass % in total of at least one di-$C_8$ to $C_{12}$ alkyl ester of a dicarboxylic acid;

(d) from 0 to 15 mass % in total of at least one conventional extreme pressure agent:

(e) from 0 to 8 mass % in total of at least one conventional VI improver; and

(f) from 0 to 5 mass % of at least one conventional pour point depressant;

the components (a) to (f) totalling together 100 mass %, and said components (a) to (f) also representing at least 95 mass % of the whole lubricating oil composition.

4,370,248

## BORATED HYDROXYL-CONTAINING ACID ESTERS AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 132,023, Mar. 20, 1980, abandoned. This application Dec. 16, 1980, Ser. No. 216,881

Int. Cl.³ C07F 5/04; C10M 1/54

U.S. Cl. 252—49.6 19 Claims

10. A lubricant composition comprising lubricant and a friction reducing amount of a product of reaction obtained by initially reacting (1) a branched aliphatic polyhydric alcohol containing 3 or 4 hydroxyl groups with a monocarboxylic acid such that the initial compound has 2 or 3 acyl groups, 2 when the alcohol has 3 or 4 hydroxyl groups and 3 only when the alcohol has 4 hydroxyl groups and then reacting the ester obtained with (2) a boron compound.

---

4,370,249

## FIRE-RETARDANT CELLULOSE INSULATION AND METHOD OF PRODUCTION

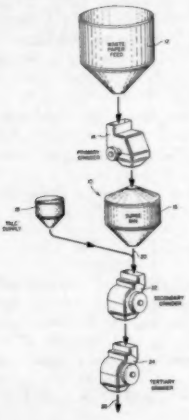
Thomas O. Bird, Idaho Falls, Id.; Jack White, 372 N. 3rd West, Rigby, Id. 83442, and Carl H. Bird, Idaho Falls, Id., assignors to Jack E. White, Rigby and Franklin N. Smith, Jr., Idaho Falls, both of, Id.

Continuation-in-part of Ser. No. 961,088, Nov. 15, 1978, Pat. No. 4,230,585. This application Jul. 9, 1980, Ser. No. 167,271

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ C04B 43/12; C09K 3/28

U.S. Cl. 252—62 4 Claims



1. A fire-resistant, cellulose insulation comprising a finely divided cellulose intimately mixed with talc, the talc being present in an amount within the range on the order of about 5% to 25% by weight and wherein a boron compound is added to the talc in amounts ranging up to 20% by weight.

---

4,370,250

## DETERGENT TABLET

David P. Joshi, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,585

Int. Cl.³ C11D 3/075, 3/08, 11/00, 17/06

U.S. Cl. 252—135 4 Claims

1. A cleaning tablet comprising a granular detergent, which prior to tableting has a flowability of at least about 70% that of clean, dry sand, said detergent in turn comprising:

(a) from about 60 to 88 percent by weight of spray dried base beads having detergent building properties, comprising from about 45 to about 85% be weight of an alkali metal phosphate wherein from about 30 to about 60 percent of the phosphate is hydrated and the remainder is anhydrous, from about 5 to about 15 percent by weight of a sodium silicate having an $Na_2O:SiO_2$ ratio of from about 1:1.6 to about 1:3.4 and from about 5 to about 15% water, wherein a portion of the water is present as water of hydration in the hydrated phosphate, the beads being essentially free of organic surfactant, organic detergent or soap, when spray dried;

(b) from about 12 to about 40 percent by weight of a nonionic polyethoxylated synthetic organic detergent;

(c) said beads having a structure of microcrystals and amorphous solid interconnected as an irregular network within

the beads, the network defining interconnected irregularly shaped passageways, said passageways comprising a reticular void space within the beads and interconnecting to discrete openings on the external surface of the beads;

(d) the nonionic detergent being applied to the external surfaces of the spray dried beads and being substantially absorbed into the internal passageways of the beads to produce the granular detergent;

(e) the beads, before tableting, having a specific gravity of from about 0.5 to about 0.8;

(f) at least 90% of the beads and the granular detergent having a particle size distributed between 20 mesh and 200 mesh U.S. sieve series; and

(g) the beads, during tableting, being subjected to compression forces of between about ¾ ton to about 3 tons per square inch.

---

4,370,251

## CONTINUOUS PROCESS FOR THE PRODUCTION OF PEROXYCARBOXYLIC ACID COMPOSITIONS

Hsiang P. Liao, Princeton; Richard A. Mohr, Martinsville, and John F. Start, Trenton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jul. 25, 1980, Ser. No. 172,329

Int. Cl.³ C01B 15/10; C07C 179/10

U.S. Cl. 252—186.42 9 Claims

1. A continuous method of producing peroxycarboxylic acid compositions from corresponding carboxylic acids having no substantial solubility in water comprising establishing in each of at least one reaction vessel comprising a reaction system a reaction mass consisting of a reaction phase having intimately interdispersed therethrough by continuous agitation an organic solvent not substantially miscible therewith and in which said carboxylic acid is not substantially soluble but in which said peroxycarboxylic acid has substantial solubility, said reaction phase consisting of said carboxylic acid, a concentrated strong acid in which said carboxylic acid is substantially soluble, hydrogen peroxide, and resulting reaction products, continuously introducing feed into the first vessel of said system while

continuously withdrawing as effluent from the last vessel of said system a portion of said reaction mass contained therein and while continuously transferring from the next preceding vessel, if any, a portion of the reaction mass contained therein to the next succeeding vessel, if any, said feed being made up of hydrogen peroxide, said organic solvent and a solution of said carboxylic acid in said strong acid, and recovering product from said effluent in a cycle comprising first diluting the effluent with mother liquor recovered and recycled from prior effluent, which may be water-reduced, distilling the organic solvent from the diluted effluent, leaving an aqueous liquor containing crystals of the peroxycarboxylic acid previously dissolved in the organic solvent, reacting the acid of the aqueous liquor with borax to form a slurry of boric acid and sodium salt of the strong acid in an aqueous mother liquor, recycling to the step of dilution of the effluent at least the mother liquor portion of said slurry, which may be water-reduced, and separating as product a mixture of crystals of peroxycarboxylic acid, boric acid and said sodium salt from the aqueous liquid with which they are associated in said cycle at a point at which said crystals of all said substances are simultaneously present.

---

**4,370,252**

## EMULSION POLYMERIZATION PROCESS UTILIZING A HIGHLY DISPERSED ORGANOSULFUR MOLECULAR WEIGHT MODIFIER

**Carl A. Uraneck, and Earl Clark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 18,092, Mar. 6, 1979, Pat. No. 4,245,072.**
**This application Sep. 4, 1980, Ser. No. 183,796**
**Int. Cl.³ B01J *13/00***
**U.S. Cl. 252—311** **23 Claims**

1. A composition suitable for use as a molecular weight modifier in emulsion polymerization comprising a submicron dispersion formed by admixing at least one organosulfur molecular weight modifier, at least one aqueous surfactant, at least one electrolyte, and at least one cosurfactant selected from the group consisting of compounds having 3 to 20 carbon atoms per molecule and the formula of ROH, RCOOH, or $RNH_2$ wherein R is an alkyl radical, and optionally at least one hydrocarbon under conditions to reduce the average particle size of said molecular weight modifier in said submicron dispersion to less than about 10,000 Å.

---

**4,370,253**

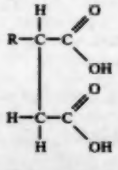
## ALKENYLSUCCINIC ACID EMULSIONS AND THEIR PREPARATION

**Charles M. Selwitz, Monroeville, and Johann G. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Jun. 19, 1980, Ser. No. 161,166**
**The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.**
**Int. Cl.³ B01J *13/00***
**U.S. Cl. 252—312** **20 Claims**

1. A process for preparing an aqueous emulsion, which comprises

(a) heating a mixture of water and an alkenylsuccinic acid-containing normally water-insoluble material comprising oleophilic organic material and less than about 95 weight percent alkenylsuccinic acid having the formula



wherein R is an alkyl group having between about 26 and about 100 carbon atoms, at a temperature of between about 50° to about 150° C. for at least about 2 minutes,

(b) cooling the resultant mixture to a temperature in the range of between about 10° and about 30° C.,

(c) vigorously stirring the cooled mixture while maintaining the temperature in the range of between about 10° and below about 40° C. for at least about 2 minutes thereby forming a stable emulsion wherein the average particle diameter of the emulsion particles is between about 2 and about 30 microns.

---

**4,370,254**

## USE OF PERFLUOROALKANE SULPHONAMIDE SALTS AS SURFACE ACTIVE AGENTS

**Karl-Heinz Mitschke, Odenthal, and Hans Niederprüm, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed May 12, 1980, Ser. No. 148,893**
**Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921142**
**Int. Cl.³ B01F *17/26***
**U.S. Cl. 252—355** **5 Claims**

1. In the lowering of the surface tension of an aqueous solution by adding thereto a surface active agent, the improvement which comprises employing as the surface active agent a salt of a perfluoroalkane sulphonamide.

---

**4,370,255**

## STABILIZATION OF AQUEOUS SILICATES USING ALKALI SILICONATES OF SILYLALKYL PHOSPHONATES

**Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.**

**Continuation of Ser. No. 891,584, Mar. 30, 1978, abandoned.**
**This application Mar. 18, 1981, Ser. No. 245,059**
**Int. Cl.³ C09K *3/00***
**U.S. Cl. 252—389 A** **77 Claims**

1. A composition of matter which is an alkali siliconate silylalkyl phosphonate which has the general formula

wherein

M is selected from a group consisting essentially of alkaline metal cations selected from a group consisting of sodium, potassium, lithium and rubidium and tetraorgano ammonium cations;

R is a divalent aliphatic hydrocarbon radical containing 1–3 carbon atoms or the benzylene radical;

P is the phosphorus atom and,

R′ is a hydrocarbon radical containing from 1–7 carbon atoms.

---

**4,370,256**

## CORROSION INHIBITOR FOR ALUMINUM IN AQUEOUS ACIDS

**Billy D. Oakes, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 760,043, Jan. 17, 1977, abandoned. This application Mar. 24, 1980, Ser. No. 133,214**
**Int. Cl.³ C23F *11/04*; C23G *1/06***
**U.S. Cl. 252—391** **5 Claims**

1. A corrosion inhibiting composition comprising benzotriazole and an anionic surfactant selected from the group consisting of alkali metal alkyl, aryl and alkylaryl sulfates and

sulfonates; said surfactant being present in from about 25 to about 67 percent of said composition.

---

4,370,257

## CATALYST COMPONENT FOR POLYMERIZATION OF ALPHA-OLEFINS AND METHOD FOR USING THE SAME

**Masafumi Imai, Ooi; Hiroshi Ueno, Namekawa; Naomi Inaba, Ooi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 11, 1980, Ser. No. 177,024**

**Claims priority, application Japan, Aug. 30, 1979, 54-109681**

**Int. Cl.³ C08F** *4/02, 4/64*

**U.S. Cl. 252—429 B** **14 Claims**

1. A supported titanium-containing catalyst component obtained by contacting at a temperature in the range of about 50° to 200° C. (1) a magnesium-containing solid represented by the formula R'OMgX, said magnesium-containing solid obtained by reacting (a) magnesium metal, (b) a halogenated hydrocarbon represented by the formular RX wherein R can be an alkyl, aryl or cycloalkyl group having 1 to about 20 carbon atoms and X is a halogen atom, and (c) a compound represented by the formula $X'_mC(OR')_{4-m}$ wherein X' can be a hydrogen atom, a halogen atom, an alkyl, aryl, cycloalkyl group having from 1 to about 10 carbon atoms or a halogenated alkyl, aryl or cycloalkyl group, R' can be an alkyl or cycloalkyl group having from 1 to about 20 carbon atoms and m is 0, 1 or 2, (2) a titanium compound and (3) one of an electron donor or a compound capable of producing in situ an organic carboxylic acid ester.

---

4,370,258

## CATALYST SYSTEM FOR HYDROFORMYLATION OF OLEFINS

**Ikuei Ogata; Yasuziro Kawabata, both of Tokyo; Masato Tanaka, Musashi Murayama, and Teruyuki Hayashi, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan**

**Division of Ser. No. 134,100, Mar. 26, 1980, abandoned, which is a division of Ser. No. 18,879, Mar. 9, 1979, Pat. No. 4,229,381. This application May 7, 1981, Ser. No. 261,488**

**Claims priority, application Japan, Mar. 9, 1978, 53-26824**

**Int. Cl.³ B01J** *31/18, 31/12, 31/21*

**U.S. Cl. 252—429 R** **5 Claims**

1. A catalyst system for hydroformylation of olefins, which comprises, (1) at least $1\times10^{-5}$ mole of a platinum catalyst, calculated as metallic platinum, per mole of said olefin; (2) 0.5 to 50 moles of an assistant catalyst per mole of said platinum catalyst, calculated as metallic platinum, the assistant catalyst being selected from the group consisting of halides of metals of group IVb of the periodic table; and (3) 0.5 to 10 moles of a bidentate ligand reaction promoter per mole of said platinum catalyst, calculated as metallic platinum, said bidentate ligand having the general formula:

$$R_2X\text{-}Z\text{-}Y\text{-}Z\text{-}XR'_2$$

wherein:

(a) R and R', which may be the same or different, are selected from the group consisting of (i) an alkyl group having 1–12 carbon atoms, (ii) a cycloalkyl group having 6–7 carbon atoms, (iii) an aryl group having 6–10 carbon atoms, and (iv) an aralkyl group having 7–8 carbon atoms;

(b) X is phosphorus, arsenic or antimony;

(c) Y is an alkylene group having 1–3 carbon atoms, a phenylene group, a naphthylene group, or an alicyclic group having a 3- to 6-membered ring; and

(d) Z is a methylene group or oxygen.

4,370,259

## OXIDATIVE DEHYDROGENATION CATALYST

**Alan D. Eastman, and John H. Kolts, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 149,601, May 13, 1980, Pat. No. 4,310,717. This application Oct. 6, 1981, Ser. No. 308,980**

**Int. Cl.³ B01J** *27/14, 31/12*

**U.S. Cl. 252—437** **6 Claims**

1. A catalyst composition consisting essentially of a mixture of oxides of

(a) manganese,

(b) phosphorus, and

(c) an alkali metal wherein the atomic ratio of (a):(b):(c) is 1:0.03 to 0.25:0.06 to 0.30.

---

4,370,260

## METHOD OF PREPARING SUPPORTED PLATINUM GROUP METAL CATALYSTS

**Gwan Kim, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.**

**Filed Apr. 20, 1981, Ser. No. 255,967**

**Int. Cl.³ B01J** *27/02, 27/24*

**U.S. Cl. 252—438** **20 Claims**

1. A method of preparing a platinum group metal catalyst composition comprising impregnating a refractory inorganic oxide support with a mixture having a pH from about 1 to about 5, said mixture comprising a platinum sulfito complex solution, a palladium sulfito complex solution, and a rhodium nitrate solution, and activating the impregnated support.

---

4,370,261

## CARRIER CATALYST FOR THE PREPARATION OF VINYL ACETATE FROM ETHYLENE, ACETIC ACID AND OXYGEN IN THE GASEOUS PHASE

**Friedrich Wunder, Flörsheim am Main; Therese Quadflieg; Günter Roscher, both of Kelkheim, and Günther Heck, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 13, 1979, Ser. No. 20,038**

**Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811115**

**Int. Cl.³ B01J** *21/08, 23/38, 35/00*

**U.S. Cl. 252—460** **3 Claims**

1. An improved catalyst for the preparation of vinyl acetate in the gaseous phase from ethylene, acetic acid and oxygen or oxygen-containing gases of the type containing as an active component a noble metal of subgroup VIII optionally in admixture with gold and/or a compound thereof and an activator of an alkali metal compound and/or an alkaline earth metal compound and/or a cadmium compound wherein said active component is applied onto a carrer, wherein the improvement comprises a carrier consisting essentially of either ribbed rods or rods with a star-shaped cross section.

2. A catalyst as claimed in claim 1, wherein the cross section of the rods represent a 4- to 6-pointed star.

3. A catalyst as claimed in claims 1 or 2, wherein the carrier consists of silicic acid.

---

4,370,262

## CATALYTIC STRUCTURE FOR TREATING EXHAUST GASES AND A PROCESS FOR MAKING THE CATALYTIC STRUCTURE

**Yukio Takahashi; Yoshijiro Arikawa, and Yoshio Yakushiji, all of Kure, Japan, assignors to Babcock-Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 17, 1980, Ser. No. 160,279**

**Claims priority, application Japan, Jun. 18, 1979, 54-77272**

**Int. Cl.³ B01J** *21/04, 23/22, 23/28, 23/30*

**U.S. Cl. 252—464** **33 Claims**

1. A catalytic structure for treating exhaust gases, composed of a substrate, a roughened surface made of fine particles of

aluminum deposited on the surface of said substrate, an aluminum oxide layer formed on said roughened surface, and a catalytic substance adhered onto said aluminum oxide layer,

said catalytic structure being formed by spraying molten aluminum onto the surface of a substrate in the presence of oxygen, adhering a catalytic substance onto the resulting surface, and calcining at 300°–500° C.

---

**4,370,263**

## CATALYST FOR THE PHOTO-DECOMPOSITION OF WATER AND PROCESS FOR THE PREPARATION OF THE CATALYST

**Mario Visca, Alessandria, Italy, assignor to Sibit, S.p.A., Milan, Italy**

**Filed Jun. 29, 1981, Ser. No. 278,357**

**Claims priority, application Italy, Jun. 30, 1980, 23123 A/80; Nov. 7, 1980, 25828 A/80**

**Int. Cl.³ B01J** *21/06, 23/20, 23/46*

**U.S. Cl. 252—472** **7 Claims**

1. Catalyst for the photodecomposition of water, characterized in that said catalyst consists of particles of $TiO_2$ doped with Nb, said particles containing $RuO_2$ on their surface.

---

**4,370,264**

## METHOD FOR THE COLD STERILIZATION OF PREPARATIONS CONTAINING BLOOD COAGULATION FACTOR VIII

**Ronald Kotitschke, and Wolfgang Stephan, both of Dreieich, Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Sep. 8, 1981, Ser. No. 300,074**

**Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033932**

**Int. Cl.³ C07G** *7/00*

**U.S. Cl. 260—112 B** **6 Claims**

1. A process for the cold sterilization of a preparation containing blood coagulation factor VIII, comprising

(A) contacting a protein solution containing factor VIII with a physiologically compatible, non-ionogenic tenside, and then subjecting the solution to

(B) irradiation with ultraviolet light,

(C) treatment with beta-propiolactone, and

(D) to an adsorption treatment with colloidal silica, steps B-C-D being performed in the sequence B-C-D, B-D-C, D-C-B or D-B-C.

---

**4,370,265**

## WATER SOLUBLE AGENTS EFFECTIVE AS IMMUNOLOGICAL ADJUVANTS FOR STIMULATING IN THE HOST THE IMMUNE RESPONSE TO VARIOUS ANTIGENS AND COMPOSITIONS, NOTABLY VACCINES CONTAINING SAID WATER SOLUBLE AGENTS

**Arlette Adam, Palaiseau; Françoise Audibert, Neuilly; Louis Chedid; Jean Choay, both of Paris; Rita Ciorbaru, Montrouge; Fabrielle Ellouz, Bagneux; Dominique Juy, Paris; Pierre Lefrancier, Bures sur Yvette; Claude Merser, Olivet; Jean-Francois Petit, Paris; Pierre Sinay, Orleans, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation, Neuilly-sur-Seine, France**

**Division of Ser. No. 516,991, Oct. 22, 1974, Pat. No. 4,186,194. This application May 15, 1978, Ser. No. 906,003**

**Int. Cl.³ C07C** *103/52*

**U.S. Cl. 260—112.5 R** **1 Claim**

1. N-Acetylmuramyl-L-alanyl-D-glutamic acid.

---

**4,370,266**

## MYCOPLANECIN DERIVATIVES AND THEIR PREPARATION

**Mamoru Arai; Tatsuo Haneishi; Mutsuo Nakajima; Akio Torikata, and Ryuzo Enokita, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan**

**Filed Apr. 3, 1981, Ser. No. 250,709**

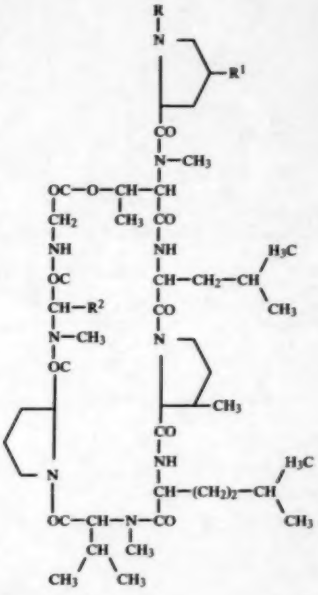
**Claims priority, application Japan, Apr. 7, 1980, 55-45402; Apr. 8, 1980, 55-46003**

**The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.**

**Int. Cl.³ C07C** *103/52*

**U.S. Cl. 260—112.5 R** **3 Claims**

1. Compounds of formula (I):



(I)

wherein:

R represents a hydrogen atom, an N-(α-ketobutyryl)-N-methylvalyl group or an N-(α-hydroxybutyryl)-N-methylvalyl group;

$R^1$ represents a methyl group or an ethyl group; and

when $R^1$ represents a methyl group, $R^2$ represents an isobutyl group, and, when $R^1$ represents an ethyl group, $R^2$ represents a pentyl group.

---

**4,370,267**

## FRACTIONATION AND ISOLATION OF 7S AND 11S PROTEIN FROM ISOELECTRICALLY PRECIPITATED VEGETABLE PROTEIN MIXTURES

**William F. Lehnhardt, Decatur; Paul W. Gibson, Mt. Zion, and Frank T. Orthoefer, Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.**

**Filed Aug. 10, 1981, Ser. No. 291,760**

**Int. Cl.³ A23J** *1/14*

**U.S. Cl. 260—123.5** **13 Claims**

1. A method for converting vegetable protein 7S and 11S mixtures into an enriched 7S protein fraction and an enriched 11S protein fraction, said method comprising:

(a) adding to an aqueous vegetable protein slurry which contains isoelectrically precipitated 7S protein and 11S protein as the major protein components of said slurry a

sufficient amount of base to adjust the pH of the slurry to a pH ranging from 5.0 to 5.6 and water-soluble salt to provide a water-soluble salt molar concentration ranging from about 0.01 M to about 0.2 M;

(b) extracting a sufficient amount of 7S protein from the isoelectrically precipitated mixture to provide an enriched water-soluble 7S fraction and an enriched 11S water-insoluble fraction which contains, on a weight basis, 11S as the major water-insoluble protein;

(c) partitioning the extracted 7S protein fraction from the water-insoluble 11S fraction; and

(d) recovering the enriched 7S fraction and the enriched 11S fraction.

---

**4,370,268**

**REACTIVE DYESTUFFS**

**Walter Scholl, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

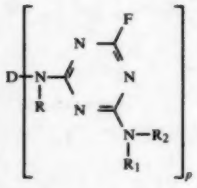
**Filed Nov. 2, 1978, Ser. No. 956,909**

**Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749647**

**Int. Cl.³ C09B** *62/04, 62/06, 62/08, 62/10*

**U.S. Cl. 260—146 T** **12 Claims**

1. Reactive dyestuffs of the formula

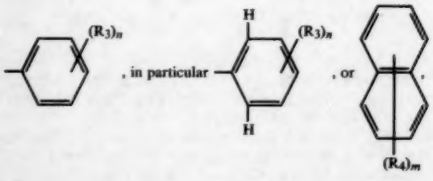


D = the radical of a 1:1 or 1:2 Cr or Co azo complex dyestuff,

R = H or $C_1$–$C_5$-alkyl which is unsubstituted or substituted by chloro, bromo, fluoro, hydroxy or sulfo,

$R_1$ = H or $C_1$–$C_5$-alkyl which is unsubstituted or substituted by chloro, bromo, fluoro, hydroxy or sulfo,

$R_2$ = H, alkyl,



n = 0, 1, 2 or 3,

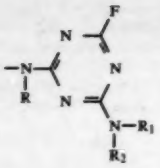
p = 1 or 2,

$R_4$ = sulfo, carboxy, $C_1$–$C_5$-alkyl, $C_1$–$C_5$-alkoxy, chloro, bromo or fluoro,

m = 0, 1 or 2 and

$R_3$ = sulfo, carboxy, $C_1$–$C_5$-alkyl, $C_1$–$C_5$-alkoxy, chloro, bromo or fluoro,

the radical



being bonded, directly or via an intermediate member, to a C atom of an aromatic-carbocyclic or aromatic-heterocyclic ring in D.

---

**4,370,269**

**MONOAZO PIGMENT DERIVED FROM ACETOACETYLAMINO BENZIMIDAZOLONE**

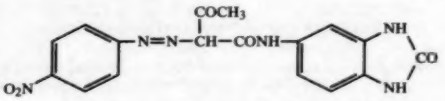
**Friedrich W. Weingarten, Liederbach am Taunus; Klaus Hunger, and Ernst Klappert, both of Kelkheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 457,971, Apr. 4, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,312**

**Int. Cl.³ C09B** *29/01, 29/32, 29/33;* **D06P** *1/44*

**U.S. Cl. 260—157** **1 Claim**

1. The monoazo pigment of the formula:



---

**4,370,270**

**NOVEL PIGMENTARY FORM OF β-COPPER PHTHALOCYANINE**

**Gustav Bock, Neustadt, and Wolfgang Fabian, Wilhelmsfeld, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany**

**Filed Jun. 17, 1981, Ser. No. 274,423**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023722**

**Int. Cl.³ C09B** *47/04*

**U.S. Cl. 260—245.87** **2 Claims**

1. A copper phthalocyanine pigment in the β-modification, which consists, to the extent of at least 50% by weight, of flakes which are not less than 10 μm long and not less than 3 μm wide, the length:width ratio being not less than 3.3:1, and which has a reflection maximum between 610 and 640 nm and another between 710 and 740 nm.

---

**4,370,271**

**PROCESS FOR THE PARTIAL REDUCTION OF C21-STEROID CARBOXYLIC ACIDS AND THEIR ESTERS TO C21-STEROID ALCOHOLS AND NEW C21-STEROID ALCOHOLS**

**Wolfgang Preuss, Monheim, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany**

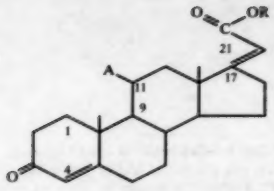
**Filed May 12, 1981, Ser. No. 262,969**

**Claims priority, application Austria, May 16, 1980, 2628/80**

**Int. Cl.³ C07J** *5/00*

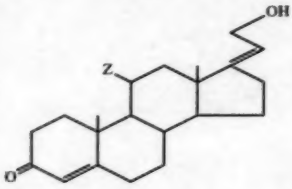
**U.S. Cl. 260—397.45** **10 Claims**

1. A process for the partial reduction of Δ4,17(20)-C21-steroid carboxylic acids optionally containing further double bonds in the 1- and/or 9(11)-position and their esters corresponding to general formula I below:



(I)

in which R represents hydrogen or a hydrocarbon radical and A represents hydrogen, hydroxyl or, together with the C-atom substituted by A, a carbonyl group and in which, the substituent A may be replaced by an additional olefinic double bond in the 9(11)-position, to C21-steroid alcohols corresponding to general formula II below:



(II)

in which Z has the same meaning as A, but in this case represents hydroxyl instead of a carbonyl group, characterized in that the starting material of general formula I which is unprotected in the A-ring of the steroid ring system is reacted with diisobutyl aluminum hydride in such quantities that all the oxygen-containing functional groups are reduced to the hydroxyl group, and an intermediate Al-containing reaction product is obtained, after which said intermediate Al-containing reaction product is subjected to selective Oppenauer oxidation to form the 3-keto compound.

8. 21-acetoxy-pregna-1,4,9(11),17(20)-tetraene-3-one.

---

**4,370,272**

## ALKOXYLATED QUATERNARY AMMONIUM SURFACTANTS

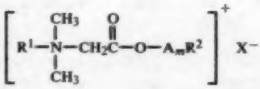
**Joseph R. Wechsler, Chicago, and Mark Lane, Shorewood, both of Ill., assignors to Stepan Chemical Company, Northfield, Ill.**

**Continuation-in-part of Ser. No. 111,688, Jan. 14, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,402**

**Int. Cl.³ C11D 1/40**

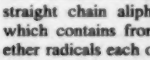
**U.S. Cl. 260—404** **13 Claims**

1. A compound of the formula

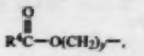


wherein

$R^1$ is a radical selected from the group consisting of (a) straight chain aliphatic hydrocarbon radicals each of which contains from 12 through 24 carbon atoms, (b) ether radicals each of which has the structure: $R^3O(CH_2)_y$—, (c) amide radicals each of which has the structure



and (d) ester radicals each of which has the structure



$R^2$ is a straight chain aliphatic hydrocarbon radical containing from 12 through 32 carbon atoms,

$R^3$ is a straight chain aliphatic hydrocarbon radical containing from 8 through 18 carbon atoms,

$R^4$ is a straight chain aliphatic hydrocarbon radical containing from 7 through 17 carbon atoms,

A is an alkoxy radical containing one oxygen atom and either two or three carbon atoms,

X is an atom selected from the group consisting of bromine and chlorine,

m is an integer of from 1 through 12, and

y is an integer which is either 2 or 3.

---

**4,370,273**

## AMIDOAMINE OXIDES OF POLYMERIC FATTY ACIDS

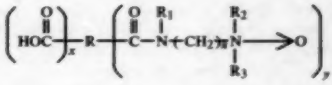
**Donald V. Kinsman, Fort Thomas, Ky., and Clement H. Luken, Jr., Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio**

**Filed Feb. 6, 1981, Ser. No. 232,101**

**Int. Cl.³ C09F 5/00**

**U.S. Cl. 260—404.5** **9 Claims**

1. Amidoamine oxides of polymeric fatty acids obtained by the polymerization of olefinically unsaturated $C_{16-20}$ monocarboxylic acids and having the formula



where R represents the hydrocarbon radical residue of the polymeric fatty acid, $R_1$ is hydrogen or an alkyl group having 1 to 4 carbon atoms, $R_2$ and $R_3$ are alkyl groups having 1 to 4 carbon atoms, n is an integer from 2 to 5, y is 1, 2 or 3 and x is an integer so that x+y is equal to 2 or 3.

---

**4,370,274**

## OLIVE OIL RECOVERY

**Harvey E. Finch, Foster City, and Salvatore P. Trapanese, Millbrae, both of Calif., assignors to FPS Development Partnership, Sacramento, Calif.**

**Filed Dec. 23, 1980, Ser. No. 220,170**

**Int. Cl.³ C11B 1/00, 1/08**

**U.S. Cl. 260—412.3** **28 Claims**

1. A method for recovering olive oil from olives comprising:

separating olive pits from olives to obtain a pitless olive meat;

continuously introducing the pitless olive meat to an extraction zone;

mixing an inert additive with the pitless olive meat in the extraction zone;

continuously withdrawing a liquid phase comprising water, olive oil, and a minor proportion to olive pulp from a first portion of the extraction zone;

continuously withdrawing a substantially dry solid olive pulp from a second portion of the extraction zone;

separating the minor proportion of olive pulp from the liquid phase for obtaining a mixture comprising olive oil and water; and

separating water from the mixture for obtaining an olive oil substantially free of water.

4,370,275

## PROCESS FOR THE PREPARATION OF CARBONIC ACID ESTERS

Günter Stammann, Cologne; Robert Becker, Leverkusen; Johann Grolig, Leverkusen, and Helmut Waldmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,363

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016187

Int. Cl.³ C07C *68/00*

U.S. Cl. 260—463 8 Claims

1. Process for the preparation of carbonic acid esters which comprises reacting an alcohol, carbon monoxide and molecular oxygen in the liquid phase, in the presence of a catalyst system which contains

(a) copper and/or copper ions,

(b) one or more anions selected from oxide anion, hydroxide anion and carbonate anion,

(c) halide ions,

(d) one or more nitrogen bases and

(e) optionally, other metal ions of metals from main group 2, of the lanthanide and/or actinide groups and/or of metals with atomic numbers of 25 to 30,

these components (a)–(e) being contained in amounts corresponding to

a ratio of total halide to total metal ranging from 0.5:1 to 2:1 expressed ingram-atoms,

a molar ratio of total nitrogen base to total metal ranging from 0.1:1 to 1.4:1,

a molar ratio of anions corresponding to component (b) to metal halides or metal halide complexes from 0.5:1 to 3:1, and

a ratio of the optionally used other metal ions to copper or copper ions ranging up to 0.625:1 expressed in gram-atoms.

---

4,370,276

## PROCESS FOR THE CONTINUOUS PREPARATION OF DIALKYLPEROXYDICARBONATES

Hans Appel, and Gottfried Brossmann, both of Munich, Fed. Rep. of Germany, assignors to Peroxide Chemie GmbH, Munich, Fed. Rep. of Germany

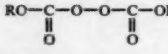
Filed Sep. 16, 1981, Ser. No. 302,863

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038164

Int. Cl.³ C07C *179/18*

U.S. Cl. 260—463 14 Claims

1. Process for the continuous production of dialkylperoxydicarbonates of the formula



(I)

in which R is individually selected from straight-chained, cyclic or branched alkyl radicals of 6 to 18 carbon atoms, which process comprises continuously reacting a chloroformic acid ester of the formula

(II)

wherein R is identified as above, in an aqueous medium with hydrogen peroxide and an alkali metal hydroxide at a temperature of from −10° C. to +50° C. in at least two reaction zones connected in series, continuously isolating the dialkylperoxydicarbonate formed from the solvent-free reaction mixture with the use of a centrifuge, wherein the reaction is carried out in the presence of a surfactant and the dialkylperoxydicarbonate formed is separated in molten form from the alkaline reaction mixture heated to or just above the melting temperature of the dialkylperoxydicarbonate.

---

4,370,277

## PHENOXY-CINNAMYL ALCOHOLS

Wolfgang Welter, and Hilmar Mildenberger, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

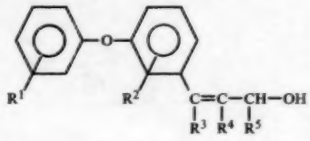
Filed Oct. 26, 1981, Ser. No. 315,156

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040487

Int. Cl.³ C07C *121/75, 43/23*

U.S. Cl. 260—465 F 3 Claims

1. Phenoxycinnamyl alcohols of the formula:



(I)

in which:

$R^1$ is hydrogen, halogen, ($C_1$–$C_4$)alkyl or ($C_1$–$C_4$)alkoxy,

$R^2$ is hydrogen, halogen, ($C_1$–$C_4$)alkyl or trifluoromethyl,

$R^3$ is hydrogen, Cl, Br, ($C_1$–$C_4$)alkyl or cyano,

$R^4$ is hydrogen, halogen, ($C_1$–$C_4$)alkyl, phenyl or halophenyl,

$R^5$ is hydrogen, ($C_1$–$C_4$)alkyl, ($C_1$–$C_3$)alkinyl or cyano.

---

4,370,278

## NUCLEOPHILIC SUBSTITUTION PROCESS

Barbara C. Stahly, and G. P. Stahly, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,321

Int. Cl.³ C07C *121/78, 121/66, 53/132*

U.S. Cl. 260—465 E 20 Claims

1. A process for the preparation of 2-(fluoronitrobenzene)alkyl cyanides which comprises reacting a fluoronitrobenzene with an alpha-substituted alkyl cyanide in a substantially anhydrous aprotic solvent and in the presence of a base so that the alkyl cyanide reactant undergoes a nucleophilic substitution reaction on an unsubstituted carbon atom of the fluoronitrobenzene during which the alpha-substitutent of the alkyl cyanide reactant functions as a leaving group.

15. A process for the preparation of 2-(fluorobiphenylyl) propionic acids which comprises (i) reacting a fluoronitrobenzene with an alpha-substituted propionitrile in a substantially anhydrous aprotic solvent and in the presence of a base so that the alpha-substituted propionitrile undergoes a nucleophilic substitution reaction on an unsubstituted carbon atom of the fluoronitrobenzene during which the alpha-substituent of the propionitrile functions as a leaving group and a 2-(fluoronitrobenzene) propionitrile is formed, (ii) reducing the nitro substituent of said 2-(fluoronitrobenzene) propionitrile to an amino substituent so that a 2-(aminofluorobenzene) propionitrile is formed, (iii) converting said 2-(aminofluorobenzene) propionitrile into a 2-(fluorobiphenylyl) propionitrile by means of a Gomberg-Bachmann reaction, and (iv) converting said 2-(fluorobiphenylyl) propionitrile into the 2-(fluorobiphenylyl) propionic acid.

4,370,279

## PROCESS FOR PRODUCTION OF ACRYLONITRILE

Yutaka Sasaki, Yokohama; Tomio Nakamura, Ichikawa; Yoshimi Nakamura, Kawasaki; Kiyoshi Moriya, Kanagawa; Hiroshi Utsumi, Yokohama, and Shigeru Saito, Tokorozawa, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 786,740, Apr. 11, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,351

Claims priority, application Japan, Apr. 10, 1976, 51-39813

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.³ C07C *120/14*

U.S. Cl. 260—465.3 34 Claims

1. A process for producing acrylonitrile by the vapor-phase catalytic ammoxidation of propylene, which comprises

(I) reacting propylene, a molecular oxygen-containing gas and ammonia in the presence of a catalyst expressed by the following empirical formula

$$Fe_aSb_bMo_cMe_dTe_eQ_fNa_gO_h(SiO_2)_i$$

wherein Me is at least one element selected from the group consisting of V and W,

Q is at least one element selected from the group consisting of Cu, Mg, Zn and Ni, and

the subscripts a, b, c, d, e, f, g, h and i each represents atomic ratios such that when a=10; b=13 to 20; c=0.1 to 2.5; d=0.05 to 1; e=0.2 to 5; f=0 to 4; g=0 to 3; h=the number of oxygens corresponding to the oxide formed by the combination of said components; and i=25 to 200;

in a fluidized bed catalytic reaction zone at a temperature of about 380° to about 500° C. and a pressure of about 0.2 to about 3 kg/cm²-G while adjusting the propylene/oxygen/ammonia molar ratio to about 1:about 1:about 0.8 to about 1:about 4:about 3;

(II) said catalyst being prepared by

(1) intimately mixing starting materials for said Fe, Mo, Me, Te and Q components in a form soluble in water or nitric acid, a starting material for the Sb component, and silica sol, thereby to form a slurry containing these components and having a non-volatile solids content of about 10 to about 50% by weight;

(2) so that the composition of the final catalyst is within the range expressed by said empirical formula above;

(3) spray-drying the resulting slurry, and

(4) calcining the resulting spray-dried particles at a temperature of about 600° to 950° C. thereby to form a catalyst with a composition within the above empirical formula and with all of the Mo, Me, and Te components substantially dissolved in an iron/antimony oxide compound ($FeSbO_4$) in the form of a solid solution.

---

4,370,280

## PHOSPHONOHYDROXYACETONITRILE, A PROCESS FOR ITS PREPARATION AND ITS USE AS AN INTERMEDIATE PRODUCT FOR THE PREPARATION OF MEDICAMENTS

Hermann Oediger, Cologne; Folker Lieb, Leverkusen, and Hans Disselnkötter, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

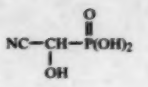
Filed Oct. 5, 1981, Ser. No. 308,734

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039997

Int. Cl.³ C07C *120/00, 121/36*

U.S. Cl. 260—465.6 5 Claims

1. A compound which is phosphonohydroxyacetonitrile of the formula



(I)

or a salt thereof.

---

4,370,281

## TRIARYL PHOSPHATES

Brian G. Clubley, Wilmslow; Thomas G. Hyde, Sale, and John F. E. Keenan, Cheadle Hulme, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

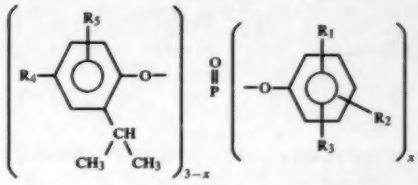
Continuation-in-part of Ser. No. 57,249, Jul. 13, 1979, abandoned. This application Sep. 29, 1981, Ser. No. 306,934

Claims priority, application United Kingdom, Jul. 21, 1978, 30742/78

Int. Cl.³ C07F *9/09*

U.S. Cl. 260—966 4 Claims

1. Mixtures of triaryl phosphates of the overall general formula I



wherein x is 1 or 2, $R_1$ is hydrogen $R_2$ and $R_3$ are the same or different and represent hydrogen, t-butyl or isopropyl, $R_4$ is hydrogen or an isopropyl group and $R_5$ is an isopropyl group with the proviso that at least one of the aryl radicals is a di-isopropylphenyl radical, but not more than two of the three aryl groups are identical.

---

4,370,282

## CONTROL DEVICE FOR ACCELERATION PUMP

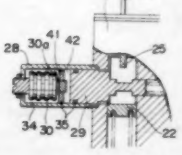
Junichi Yokoyama, Ebina, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 27, 1981, Ser. No. 287,177

Claims priority, application Japan, Jul. 28, 1980, 55-106666[U]

Int. Cl.³ F02M *7/08*

U.S. Cl. 261—34 B 8 Claims




3. A device for controlling an acceleration pump for a carburetor comprising:

a carburetor body;

an acceleration pump having an acceleration pump cylinder vertically formed in the carburetor body;

a piston slidably placed in the acceleration pump cylinder in a first direction;

a cylindrical stopper casing extending in a second direction substantially perpendicular to the first direction;

a stopper slidably placed in the stopper casing;

said piston having therein a spring chamber formed in the first direction near the upper end of the piston, a hole extending through a portion of the piston, and a pin-like positioning member formed integrally with the piston and protruding into the hole in the first direction;

a push rod having at its lower end a flange like portion slidably placed in the spring chamber;

a coil spring disposed in the spring chamber at the flange like portion of the push rod thereby to bias the push rod upwardly in the first direction;

a return spring placed at the lower end of the piston to bias the piston upwardly in the first direction;

said stopper extending through the hole of the piston;

said carburetor body having a cylinder portion opposing the stopper casing;

actuating means responsive to variations in atmospheric pressure for moving the stopper through the hole;

a spring placed within the cylinder portion of the carburetor body to bias the stopper so that the stopper is pressed against the actuating means by the biasing force thereof;

said stopper having at its intermediate portion first and second small diameter portions in a stepped form, enabling the pin-like positioning member to selectively engage the first and second small diameter portions during stopper movement in the second direction caused by the actuating means in response to variations in atmospheric pressure to selectively shorten the piston stroke as a function of decreasing atmospheric pressure, thereby adjusting the air-fuel ratio.

---

**4,370,283**

## PROCESS FOR VULCANIZATION OF ELASTOMER PRODUCTS

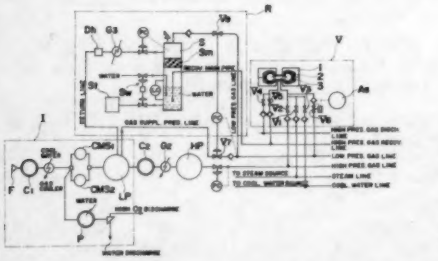
**Toshio Arimatsu, Akashi, and Tohatirou Sakon, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan**

**Filed Oct. 16, 1981, Ser. No. 311,955**

**Claims priority, application Japan, Oct. 27, 1980, 55-151171**

**Int. Cl.³ B29H *5/02***

**U.S. Cl. 264—37** **6 Claims**



1. A process for vulcanization of elastomer products which comprises the steps of heating under pressure, the elastomer product mounted in a metal mold by supplying thereto vulcanizing medium, suspending the supply of said vulcanizing medium when said elastomer product has reached a predetermined temperature or passed through a predetermined time period, subsequently supplying inert gas preliminarily extracted from atmospheric air with use of molecular sieves, and maintained at least under approximately the same pressure as that of said vulcanizing medium as a heat retaining medium, up to the termination of remaining time period for the heating step so as to maintain the elastomer product at said predetermined temperature, and, upon termination of said heating step, restoring a mixture of the inert gas and the vulcanizing medium so as to derive the inert gas through steam separation for re-utilization of said inert gas for a preshaping of the elastomer product prior to the vulcanization of said elastomer product and the like.

---

**4,370,284**

## NON-BLEEDING ELECTRODE

**Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Corporation, Dallas, Tex.**

**Filed Oct. 31, 1980, Ser. No. 202,564**

**Int. Cl.³ B29H *7/20***

**U.S. Cl. 264—42** **22 Claims**

1. An electrode precursor consisting essentially of a hydrophobic backing layer containing polytetrafluoroethylene and a pore former, an active layer containing high surface area carbon particles and a pore former and a current distributor wherein the average particle size of said active layer pore former ranges from about 1 to about 40 microns and is sufficiently large to relieve internal liquid pressures generated in said active layer during use thereof after removal of said pore formers.

---

**4,370,285**

## METHOD OF PRODUCTION OF A LIGHTWEIGHT BUILDING ELEMENT

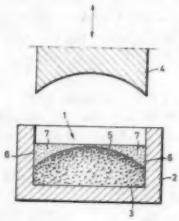
**Christian Plück, and Peter Schuster, both of Frechen, Fed. Rep. of Germany, assignors to Schneider GmbH & Co., Frechen, Fed. Rep. of Germany**

**Filed Oct. 7, 1980, Ser. No. 195,296**

**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1979, 2941370**

**Int. Cl.³ B29H *7/20***

**U.S. Cl. 264—43** **13 Claims**



1. A process of producing a lightweight building element from foamed ceramics or expanded clay aggregate, wherein expandable or foamable material is heaped in bulk into a mold, including the steps of precompacting the heaped material in the mold to obtain a molded body by performing an inhomogeneous compaction with the peripheral zones of the molded body being subjected to compaction higher than that of a core zone thereof, whereby a free space results from the higher compaction; filling said free space with additionally heaped material; finally compressing the material to obtain the precompacted body; and thereafter firing the precompacted body so that the material thereof will expand in a desired manner with subsequent cooling of the mold and the molded body.

---

**4,370,286**

## CHLORINATED POLYVINYL CHLORIDE COMPOSITION

**Samuel D. Nehmey, Lorain, and James W. Summers, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio**

**Filed Sep. 14, 1981, Ser. No. 301,905**

**Int. Cl.³ B29H *7/20***

**U.S. Cl. 264—53** **10 Claims**

1. Composition of matter adapted to be foamed comprising chlorinated polyvinyl chloride resin containing at least 60% chlorine by weight, an effective amount of a blowing agent to

cause said resin to foam, an effective amount of a nucleating agent for providing nucleating sites for forming cells filled with said blowing agent, and 1 to 30 parts by weight of a processing aid per 100 parts by weight of said resin, said processing aid has a Tg of greater than 60° C., has dilute solution viscosity greater than 1.5, and is selected from copolymers of a styrene and an unsaturated nitrile containing more than 50% of said styrene and 10 to 40% of said nitrile.

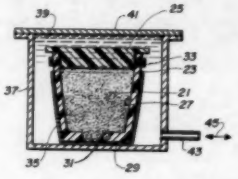
---

**4,370,287**

## PREFORM METHOD OF SYNTHESIZING A PHOSPHOR

**Robert P. Thompson, Millersville, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Mar. 20, 1981, Ser. No. 246,026**
**Int. Cl.³ B28B *11/00***
**U.S. Cl. 264—67** **9 Claims**




1. In a method of synthesizing a phosphor including the steps of providing an intimate dry mixture of compounds containing the constituent chemical elements of said phosphor, heating a quantity of said mixture to a reaction temperature to produce a friable cake of phosphor particles, cooling said cake to room temperature, and then reducing said cake to particles,

the improvement including, prior to said heating step the steps of compressing said quantity of dry mixture in a mold to a prescribed shape and to a prescribed density to produce at least one self supporting preform, removing said preform from said mold, placing said preform in a closed container and then heating said preform in said closed container to produce said friable cake.

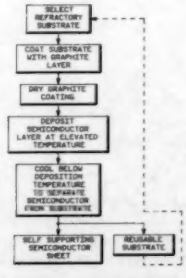
---

**4,370,288**

## PROCESS FOR FORMING SELF-SUPPORTING SEMICONDUCTOR FILM

**M. John Rice, Jr., Tempe, and Ronald N. Legge, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 18, 1980, Ser. No. 207,845**
**Int. Cl.³ B29C *13/00***
**U.S. Cl. 264—81** **10 Claims**


SELECT REFRACTORY SUBSTRATE
COAT SUBSTRATE WITH GRAPHITE LAYER
DRY GRAPHITE COATING
DEPOSIT SEMICONDUCTOR LAYER AT ELEVATED TEMPERATURE
COOL BELOW DEPOSITION TEMPERATURE TO SEPARATE SEMICONDUCTOR FROM SUBSTRATE
SELF SUPPORTING SEMICONDUCTOR SHEET
REUSABLE SUBSTRATE

1. A process for forming a self-supporting sheet or ribbon of semiconductor material which comprises the steps of: providing a sheet or ribbon substrate or refractory material having an expansion coefficient different from said semiconductor material, said substrate having a surface; coating said substrate including said surface with a layer of graphite; providing a deposition mask near an edge of said surface to limit deposition of said semiconductor material to a portion of said surface interior to said deposition mask; depositing at a first temperature a layer of said semiconductor material overlying said layer of graphite; reducing the temperature to a second temperature lower than said first temperature; and removing said layer of said semiconductor material from said substrate.

---

**4,370,289**

## FIBROUS WEB STRUCTURE AND ITS MANUFACTURE

**Wayne P. Sorenson, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.**

**Division of Ser. No. 58,902, Jul. 19, 1979, abandoned. This application Dec. 12, 1980, Ser. No. 215,835**
**Int. Cl.³ D04H *1/16***
**U.S. Cl. 264—113** **2 Claims**

1. A method of forming a fibrous web comprising the steps of dry laying on a forming wire a first layer of non-staple wood fibers of a predetermined length of about ¼ inch; forming filamentary fibers from a melt of molten polymeric material; subjecting said filamentary fibers while in a molten state to convergent air streams to attenuate the fibers until they break and form reduced diameter microfibers from about 5 inches to about 15 inches in length and in randomly oriented array; directing said randomly oriented microfibers onto said first layer of wood fibers on said forming wire to form a layer of randomly oriented overlapping polymeric microfibers on said first layer; dry laying on said layer of microfibers a second layer of non-staple wood fibers of substantially the same lengths as the fibers of said first layer; compacting said layers on said forming wire; and removing said compacted layers as a fibrous web from said forming wire.

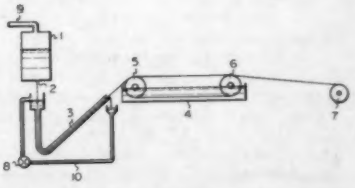
---

**4,370,290**

## PROCESS FOR PRODUCING AROMATIC POLYIMIDE FILAMENTS

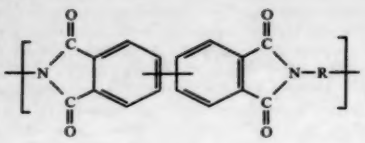
**Hiroshi Makino; Yoshihiro Kusuki; Takashi Harada, and Hiroshi Shimazaki, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Japan**

**Filed May 8, 1981, Ser. No. 261,979**
**Claims priority, application Japan, May 9, 1980, 55-60516**
**Int. Cl.³ D01F *6/00***
**U.S. Cl. 264—184** **20 Claims**




1. A process for producing aromatic polyimide filaments, comprising the steps of:

(I) preparing a spinning dope solution of a polymer material consisting of at least one aromatic polyimide having at least 90 molar % of a recurring unit of the formula (I):



(I)

wherein R represents a divalent aromatic radical, in a solvent comprising, as a main component thereof, at least one phenolic compound;

(2) extruding said spinning dope solution through at least one spinning hole to form at least one filamentary stream thereof,

(3) solidifying said filamentary stream of said spinning dope solution to provide at least one undrawn aromatic polyimide filament, and;

(4) drawing said undrawn filament at a temperature of from 20° to 600° C. at a draw ratio of from 1.5 to 5.0.

---

**4,370,291**

**PROCESS FOR PRODUCING POLYESTER FILM**

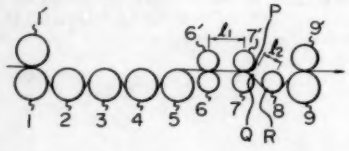
**Takahiko Kazama; Yuji Okamura, both of Otsu, and Saburo Fujita, Gifu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Sep. 21, 1981, Ser. No. 304,200**

**Claims priority, application Japan, Sep. 25, 1980, 55-132345**

**Int. Cl.³ B29D** *7/02;* **B29C** *17/02*

**U.S. Cl. 264—210.7** **12 Claims**



1. An improvement in a process for producing a polyester film which comprises melt-extruding a polyester predominantly comprised of polyethylene terephthalate into an extrudate in sheet form; quenching the extrudate to a temperature of below Tg to obtain a solidified, substantially amorphous film; drawing the film in the longitudinal direction at a drawing ratio (λt) of larger than 2.4 but smaller than 6.5; quenching the longitudinally drawn film and; then, drawing the quenched film at a drawing ratio of at least 2.5 in the transverse direction;

said improvement comprising conducting said drawing in the longitudinal direction in two steps wherein:

(i) in the first drawing step, the substantially amorphous film is drawn in one or more stages at a total drawing zone length ($l_1$) of at least 50 mm so that the resulting polyester film possesses a birefringence of from $1\times10^{-3}$ to $12\times10^{-3}$;

(ii) the drawn film is kept, without being quenched to a temperature not higher than the glass transition temperature, in contact with a roll maintained at a temperature of from 100° to 130° C.; and then,

(iii) in the second drawing step, the film is drawn at a drawing ratio ($\lambda_2$) of larger than 1.6 but smaller than 2.7 in one stage at a drawing zone length ($l_2$) of shorter than $l_1/2$.

**4,370,292**

**ENCAPSULATION OF ELECTRONIC DEVICE**

**Hiroshi Yanase; Fukuo Kanno, and Takeshi Abe, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan**

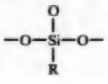
**Filed Jun. 4, 1981, Ser. No. 270,233**

**Claims priority, application Japan, Jul. 4, 1980, 55-90714**

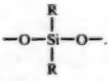
**Int. Cl.³ B29C** *6/00*

**U.S. Cl. 264—272.11** **6 Claims**

1. In an encapsulation of an electronic device with a synthetic resin compound, an improvement characterized in that said synthetic resin compound is a thermoplastic compound having low viscosity in a molding process which comprises polyphenylene sulfide and a filler at a ratio of 1:4 to 4:1 and a tacky or adhesive polymer to restrict moisture penetration at a ratio of 0.1 to 50 wt. parts per 100 wt. parts of polyphenylene sulfide and said encapsulation is carried out by a transfer molding process or an injection molding process, wherein said tacky or adhesive polymer is at least one selected from the group consisting of phenoxy resins, epoxy resins and silicone resins, and wherein said silicone resins have bonds of



or bonds of



---

**4,370,293**

**METHOD FOR THE MANUFACTURE OF BIAXIALLY ORIENTATION-STRETCHED PLASTIC FILM**

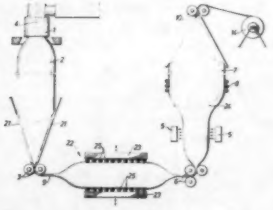
**Peter Petersen-Hoj, Espergärde, Denmark, assignor to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland**

**Filed Jul. 25, 1980, Ser. No. 172,704**

**Claims priority, application Switzerland, Jul. 26, 1979, 6935/79**

**Int. Cl.³ B29C** *17/04*

**U.S. Cl. 264—514** **8 Claims**



1. A method of manufacturing biaxially orientation-stretched plastic film, comprising the steps of extruding a plastic film through an annular die to form a seamless tube, simultaneously supplying a gas to the inside of the tube during forming to inflate the tube such that the diameter of the tube is at least doubled, simultaneously drawing out the tube at least to the same extent in its longitudinal direction, cooling the tube thus formed, flattening the tube, sealing the tube by conducting the tube between a first pair of driven rolls, expanding the tube

formed in the first inflation operation after the flattening between the first pair of rolls by introducing gas, forming a gas reservoir or gas accumulator for continuously retaining a quantity of the introduced gas between the first and second pair of rolls, flattening the tube between the second pair of rolls, controlling the pressure of the gas in the gas reservoir by selectively moving two compression plates toward and away from one another which plates are arranged on either side of the gas reservoir, inflating the flattened tube again with the gas from the reservoir to increase the diameter to orientation stretch the tube, simultaneously further stretching the inflated tube in its longitudinal direction whereby the tube material is biaxially molecular-oriented, said pressure of the gas in the gas reservoir being controlled such that sufficient pressure is provided to ensure a proper subsequent inflation of the tube and to compensate for gas loss.

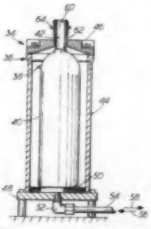
---

**4,370,294**

## COMPACTING PARTICULATE MATERIAL INTO A BODY

**Jeffrey J. Franken, Birdsborough; Walter W. Gladney, Kutztown, and William R. Yeich, West Lawn, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.**

**Filed Jan. 5, 1981, Ser. No. 222,424**
**Int. Cl.³ B29C *1/04***
**U.S. Cl. 264—571** **7 Claims**



1. A method of forming compactable material into a body having a desired size and shape, comprising:

providing a pouch of a first size, having elastic walls of sufficient strength to at least partially compact the material, such walls being expandable to a second size, larger than the desired body, and having a necked opening therein at a first end of the pouch;

disposing the pouch within a chamber having inside walls conforming to the desired shape of the body but of the second size, the first end of the pouch extending through a necked opening in said chamber and the walls of the first end being sealed to the walls of the opening such that the interior of the pouch is accessible from outside the chamber;

forming a sufficient vacuum condition between the pouch and chamber to substantially elastically expand the pouch to the size and shape of the inside walls of the chamber;

introducing the material into the pouch to load the same, said material substantially conforming, as it is introduced, to the shape and second size of the expanded pouch; and

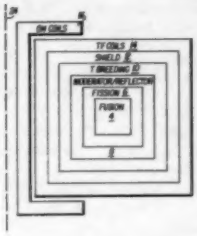
introducing air into the chamber to break the vacuum condition, thereby permitting the pouch to compress the loaded material and maintain the shape for further compacting into the desired body size and shape.

**4,370,295**

## FUSION-FISSION POWER GENERATING DEVICE HAVING FISSILE-FERTILE MATERIAL WITHIN THE REGION OF THE TOROIDAL FIELD COILS GENERATING MEANS

**Robert W. Bussard, Arlington, Va., assignor to FDX Associates, L.P., La Jolla, Calif.**

**Continuation of Ser. No. 888,804, Mar. 21, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,346**
**Int. Cl.³ G21B *1/00***
**U.S. Cl. 376—133** **12 Claims**




1. A fusion-fission reactor having a plasma containing toroidal fusion region for producing high energy neutrons from fusion reactions and a region external to said fusion region containing material which is both fissile with respect to high energy neutrons and fertile with respect to low energy neutrons, said reactor comprising:

(a) An electromagnetic toroidal field generating means having inner and outer structural contours;

(b) a region of fissile-fertile material positioned within said inner and outer structural contours of said toroidal field generating means and constituting a portion thereof; and

(c) said toroidal field generating means positioned substantially adjacent said toroidal fusion region.

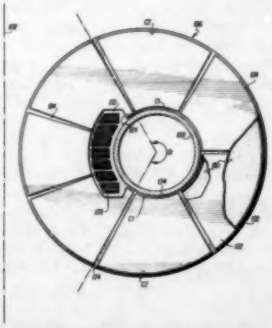
---

**4,370,296**

## TOROIDAL FUSION REACTOR HAVING OHMIC HEATING COIL SUBSTANTIALLY ADJACENT TOROIDAL FUSION REGION

**Robert W. Bussard, Arlington, Va., assignor to FDX Associates, L.P., La Jolla, Calif.**

**Continuation of Ser. No. 888,803, Mar. 21, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,347**
**Int. Cl.³ G21B *1/00***
**U.S. Cl. 376—133** **8 Claims**



1. A compact toroidal fusion reactor for producing energy from fusion reactions having a plasma containing toroidal fusion region and having a main axis, comprising:

(a) a toroidal field generating means for producing a toroidal magnetic field in said fusion region upon the passage of current therethrough, said toroidal field generating means having an inner circumferential contour and an outer edge, said inner circumferential contour having a recessed portion extending for an arcuate section along the side nearest said main axis and being positioned substantially immediately proximate said toroidal fusion region; and

(b) ohmic heating coils for ohmically heating said plasma, said ohmic heating coils positioned adjacent to said toroidal fusion region and between said toroidal fusion region and said toroidal field generating means in a region provided on the inner circumferential contour of said toroidal field generating means along the side nearest the main axis of said toroidal fusion region.

---

**4,370,297**

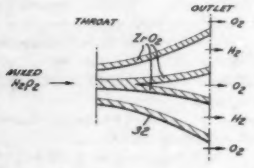
## METHOD AND APPARATUS FOR NUCLEAR THERMOCHEMICAL WATER CRACKING

**Theodor Teichmann, Plymouth, Mich., assignor to Texas Gas Transmission Corporation, Owensboro, Ky.**

**Continuation-in-part of Ser. No. 414,369, Nov. 9, 1973, abandoned. This application Jul. 7, 1976, Ser. No. 703,197**

**Int. Cl.³ G21B *1/00***

**U.S. Cl. 376—148** **9 Claims**




1. Apparatus for dissociation of steam which comprises a fusion reactor central chamber housing capable of supporting a fusion reaction from a D-T fusion fuel charge placed therein, an energy source directed into said housing to achieve a fusion reaction in said fusion fuel placed in said central chamber to produce among other fusion products alpha and neutron radiation, means for introducing steam to said central chamber in the presence of said fusion reaction to absorb alpha-particle energy therefrom causing decomposition of the steam to release molecular hydrogen, and supersonic effusion filter means for removing the molecular hydrogen from other molecules including molecular oxygen in said central chamber, said supersonic effusion filter means forming an outlet from said central chamber and comprising a zirconium dioxide tube and a zirconium dioxide nozzle on said tube enlarging from said tube to a relatively wide outlet for cooling said molecular hydrogen, said nozzle having a hollow conically shaped zirconium dioxide member pointing in the direction of said central chamber, the zirconium dioxide walls of said nozzle and said conically shaped member allowing oxygen to preferentially diffuse therethough, thereby effecting the separation of the oxygen from the hydrogen.

---

**4,370,298**

## CONTAINED FISSION EXPLOSION BREEDER REACTOR SYSTEM

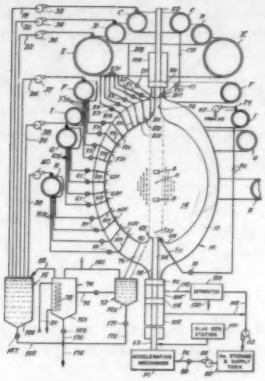
**Edward F. Marwick, 5149 Morse Ave., Skokie, Ill. 60077, and Nis H. Juhl, 5405 Wallbridge, Midland, Mich. 48640**

**Continuation-in-part of Ser. No. 544,178, Jan. 27, 1975, abandoned. This application Aug. 8, 1979, Ser. No. 64,824**

**Int. Cl.³ G21C *1/00***

**U.S. Cl. 376—317** **20 Claims**

1. A method of generating thermal energy and isotopes in a contained fission explosion, breeder reactor system, comprising the steps of providing a pressure vessel having an explosion chamber, introducing a pair of slugs each containing a subcritical mass of actinides into said chamber propelling at least one of said slug pair, said pairs being introduced successively and at predetermined time intervals into the chamber along a flight path where they intercept at or near the center of the chamber and where the combining slug masses become more than critical to produce an explosion injecting a major portion



of a working fluid into the chamber in the form of a plurality, draining the working fluid heated by the explosion from the vessel for conversion into useful work, collecting fissile, fertile and irradiated isotopes and debris from the exploded slugs as a precipitate from the working fluid, and fabricating the precipitate into additional slugs.

---

**4,370,299**

## MOLYBDENUM-BASED ALLOY

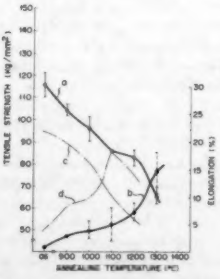
**Shotaro Morozumi, 12-504, Kawauchi-jutaku, Mubanchi, Kawauchi, Sendai-shi, Miyagi-ken, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Shotaro Morozumi, Sendai, both of, Japan**

**Filed Jul. 6, 1981, Ser. No. 280,352**

**Claims priority, application Japan, Jul. 8, 1980, 55-92198**

**Int. Cl.³ C22C *27/04***

**U.S. Cl. 420—429** **7 Claims**




1. A molybdenum-based alloy with excellent hot workability consisting essentially of 0.001 to 0.5% by weight of scandium and the remainder essentially of molybdenum.

4,370,300

## AROMATIC ODORANT EMITTING DEVICE

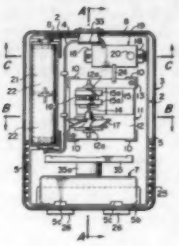
Yasuyuki Mori; Haruo Nishimura, both of Osaka, and Yoshikazu Sugahara, Fujiidera, all of Japan, assignors to Duskin Franchise Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1981, Ser. No. 324,487

Claims priority, application Japan, Jan. 23, 1981, 56-8105[U]; Jun. 10, 1981, 56-85463[U]

Int. Cl.³ B01F 3/04; A61L 9/04

U.S. Cl. 422—108 8 Claims



1. An aromatic odorant emitting device comprising:

(a) a first mainbody case **2** in a box shape having a plurality of openings **6***f* at the lower portion of its rear surface, said case being fixed onto an wall;

(b) a second cover case **3** detachably mounted onto said first case, said second case being slightly larger than the first case and having a plurality of through slits **25** for exhaustion of an air including an aromatic odorant, at its lower portion, and having the openings **28**, **30** at a center portion and a corner of an upper portion thereof;

said first case **2** containing:

(i) an aromatic odorant container **7** for containing the liquid aromatic odorant, to be placed on the bottom plate **5***b*;

(ii) an evaporator **35** having an absorbing piece **38** which is always supplied with the liquid aromatic odorant through the glass fiber bundles **37**, said aromatic odorant container being detachably mounted onto said evaporator;

(iii) a fan unit fixed on an inside thereof being positioned in opposite to said evaporator and said opening **28** for a fan **17** of said unit;

(iv) a photosensor **20** fixed on a portion of said first case **2**, being placed in opposite to said opening **30**;

(v) a thermosensor **19** for controlling a rotational speed of said fan **17**, together with said photosensor **20**;

(vi) a battery container **21** for containing at least one battery to supply its electric current to said thermosensor **19** and the photosensor **20**, being detachably provided for said first case **2**;

said second case **3** having at its upper end thereof a locking mechanism **31** comprising:

(i) a washboard-like piece **32** extending from the case **3** and having a hook **32***a* provided at its tip end for being engaged within an opening **9***a* provided on an engagement piece **9** formed on said first case **2**;

(ii) a slide lever **33** slidably attached on a backside of the washboard-like member **32**, one end **33***a* of which extending forwardly from an opening **34** formed on a front face of said second cover case, another end of which extending at a lower side of a tip end of said washboard-like member **32**, a pair of holding members **33***b*, **33***b* embracing the both sides of said forward tip end of said washboard-like member **32** being formed on said tip end of said slide lever **33**.

4,370,301

## DRY DEODORIZING APPARATUS

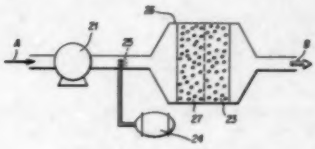
Kunihiro Doi; Tetsu Takeyama, both of Amagasaki, and Kenkoku Azuma, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1980, Ser. No. 211,286

Claims priority, application Japan, Nov. 28, 1979, 54-154099; Jul. 31, 1980, 55-105792; Jul. 31, 1980, 55-105793; Jul. 31, 1980, 55-105794

Int. Cl.³ A61L 9/015, 9/00, 9/16

U.S. Cl. 422—122 18 Claims



1. A dry deodorizing apparatus comprising:

(i) a device to diffuse ozonized air into odorous air containing bad smell components;

(ii) a dry packed layer of a porous carrier into which a bromine compound is impregnated;

(iii) a packed layer of an activated carbon; and

(iv) means for allowing said odorous air to which ozone is added to first pass through said impregnated carrier and then through said layer of activated carbon.

5. A dry deodorizing apparatus, comprising:

(i) a device to diffuse ozonized air into odorous air containing bad smell components;

(ii) a dry packed layer of a porous carrier into which a bromine compound is impregnated;

(iii) a packed layer of a porous material into which an iodide of an alkali metal or an alkali earth metal is impregnated; and

(iv) means for allowing said odorous air to which ozone is added to first pass through said carrier and then through the iodide-impregnated porous material.

---

4,370,302

## MACHINE FOR SOLID PHASE POLYMERIZATION

Akihiro Suzuoka; Toshifumi Okuhira; Eiji Matsumura, and Katsushi Sasaki, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 30, 1980, Ser. No. 221,204

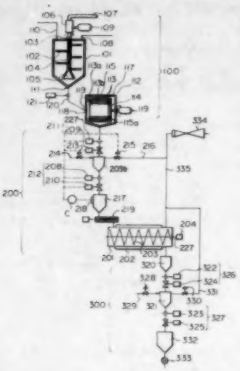
Claims priority, application Japan, Jan. 4, 1980, 55-7; Jan. 4, 1980, 55-9; Aug. 22, 1980, 55-114670

Int. Cl.³ B01J 4/00, 19/20; C08G 63/02

U.S. Cl. 422—137 4 Claims

1. A machine for solid phase polymerization comprising means defining a system for supplying particles of a synthetic polymer, means defining a reaction system for effecting solid phase polymerization under a vacuum and heated conditions to said particles of a synthetic polymer fed from said supplying system, and means defining a system for discharging said particles of a synthetic polymer which have been subjected to said solid phase polymerization in said reaction system so that their degree of polymerization is increased, characterized in that said reaction system comprises a horizontal reaction vessel, a shaft rotatable about a horizontal axis within said reaction vessel, at least one screw vane secured to said rotatable shaft and having a multiplicity of small apertures formed therein, and scrapers axially extending between adjacent screw vane portions, said supplying system comprises a pre-treatment apparatus comprising a precrystallizer wherein particles are precrystallized and a beater for separating stuck particles connected to the exit of said precrystallizer, whereby said particles of a synthetic polymer are precrystallized and beaten by means

of said pre-treatment apparatus and then are fed to said reaction system, said machine further comprising intermediate vessels disposed for communication between said reaction system and said discharging system, respectively, and vacuum



breakers comprising particle shutters and vacuum valves located downstream of said shutters disposed at the particle supply side and the particle discharge side of said intermediate vessels, respectively.

---

**4,370,303**

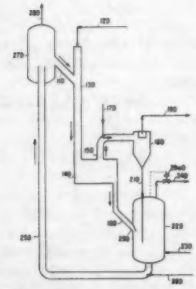
**THERMAL REGENERATIVE CRACKINC (TRC) APPARATUS**

**Herman N. Woebcke, Stamford, Conn.; Arju H. Bhojwani, Lawrenceville, N.J.; Robert J. Gartside, Auburndale, Mass., and Axel R. Johnson, North Babylon, N.Y., assignors to Stone & Webster Engineering Corp., Boston, Mass.**

**Division of Ser. No. 165,782, Jul. 3, 1980, Pat. No. 4,318,800. This application Jun. 11, 1981, Ser. No. 272,457**

**Int. Cl.³ F27B *15/08***

**U.S. Cl. 422—144** **26 Claims**



**1.** In a TRC apparatus wherein the temperature in the reaction chamber is between 1300° and 2500° F. and wherein the hydrocarbon fluid feed or the hydrosulfurization residual fluid feed oil along with the entrained inert solids and the diluent gas are passed through the reaction chamber for a residence time of 0.05 to 2 seconds, the improvements:

(1) wherein the apparatus for admixing the inert solids rapidly and intimately with the fluid feed introduced simultaneously thereto comprises:

a. an upper reservoir containing the particulate solids;

b. a conduit extending downwardly from the reservoir to the reaction chamber, said conduit being in open communication with the reservoir and reaction chamber; and

(2) a solids-gas separator designed to effect rapid removal of particulate solids from a dilute mixed phase stream of solids and gas, said separator comprising a chamber for disengaging solids from the incoming mixed phase stream, said chamber having rectilinear or slightly arcuate longitudinal walls to form a flow path essentially rectangular in cross section, said chamber also having a mixed phase inlet, a gas phase outlet, and a solids phase outlet, with the inlet at one end of the chamber disposed normal to the flow path, the solids outlet at the other end of the chamber, said solids outlet suitable for downflow of discharged solids by gravity, and the gas outlet therebetween oriented to effect a 180° change in direction fo the gas.

---

**4,370,304**

**TWO-PHASE SPRAYING DEVICE AND REACTION CHAMBER FOR THE PREPARATION OF A PRODUCT CONTAINING AMMONIUM ORTHOPHOSPHATE**

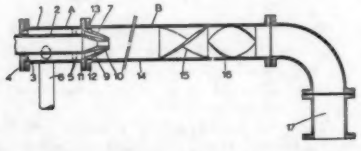
**Petrus F. A. M. Hendriks, Geleen; Arie Jansen, Ridderkerk; Willem B. van den Berg, Prinsenbeek, and Cornelis Hoek, Nieuwstadt, all of Netherlands, assignors to Unie van Kunstmestfabrieken, B.V., Utrecht, Netherlands**

**Division of Ser. No. 43,423, May 29, 1979, Pat. No. 4,313,918. This application Aug. 21, 1981, Ser. No. 294,929**

**Claims priority, application Netherlands, Jun. 1, 1978, 7805957**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 422—224** **2 Claims**



**1.** An apparatus for preparing an ammonium orthophosphate product from ammonia and phosphoric acid comprising,

a two-phase spraying means including two coaxial ducts, one positioned inside the other for supplying respectively phosphoric acid and ammonia and mixing the same together, each of said ducts being tapered and narrower at the outflow ends which are substantially coterminous with each other,

a cylindrical reaction chamber larger than and coaxial with said two-phase spraying means having at least one discharge outlet at one end thereof, and said two-phase spraying means being positioned at least partially in said chamber,

said reaction chamber having a diameter from about 2 to about 4 times the outer diameter of the outflow opening of the outer coaxial duct and said reaction chamber having a length of from about 10 to about 25 times of said diameter,

and a plurality of baffle plates arranged successively downstream of said spraying means in said chamber, each two consecutive baffle plates being twisted in opposite directions and the first of said baffle plates positioned a distance of at least 8 times the diameter of said cylindrical reaction chamber from said coterminous end.

4,370,305

## DEVICE FOR THE STERILIZATION OF FLUID SUBSTANCES

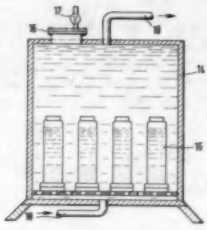
Alvaro Affonso, Bad Homburg von der Hohe, Fed. Rep. of Germany, assignor to Hoelzle & Chellus KG, Neu-Isenburg, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,104

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2929813

Int. Cl.³ A61L 2/20

U.S. Cl. 422—292 14 Claims



1. An apparatus for the sterilization of fluids comprising:

a substance capable of generating a disinfecting gas upon chemical activation;

a liquid-impermeable container surrounding said substance, at least a portion of the wall of said container being formed of a solid, non-porous, liquid-impermeable synthetic plastic barrier separating said substance from a fluid to be sterilized and permitting controlled diffusion of disinfecting gas while preventing the passage of impurities and the residue of the gas generation reaction therethrough; and

means for contacting said fluid to be sterilized with said synthetic plastic barrier.

---

4,370,306

## PROCESS FOR SEPARATION OF TRACES OF GASEOUS CONTAMINANTS FROM WASTE GASES BY CHEMICAL ABSORPTION

Kurt Kirchner, Eschborn, and Wolfgang Litzenburger, Herrstein, both of Fed. Rep. of Germany, assignors to Dechema Deutsche Gesellschaft fur Chemisches Apparatewesen E V, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 136,024

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913329

Int. Cl.³ B01D 53/34, 57/00

U.S. Cl. 423—220 17 Claims

1. In the separation of traces of halogens and sulfur from a halogen- and/or sulfur-containing gas stream wherein the gas stream is contacted with a wash liquid to absorb the halogens and sulfur, the improvement which comprises using a gas stream containing as contaminant at least one of a mercaptan, $H_2S$, HCl, HBr, HI, chlorine, bromine and iodine, and introducing into the wash liquid a pair of electrodes, the anode consisting of a heavy metal which as cation is capable of forming difficultly soluble halides or sulfides with the contaminants that are present.

---

4,370,307

## PREPARATION OF PURE MAGNESIAN VALUES

George G. Judd, Woodville, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 126,005, Feb. 29, 1980, abandoned. This application Oct. 9, 1980, Ser. No. 192,301

Int. Cl.³ C01F 5/24, 11/18

U.S. Cl. 423—432 5 Claims

1. A method for recovering a magnesium carbonate of high purity containing, on an oxide basis, at least 99 percent of magnesium carbonate and not more than 1 percent of calcium carbonate, from an aqueous magnesium hydroxide slurry consisting of water, commercially produced magnesium hydroxide and impurities normally associated with said magnesium hydroxide, and containing an amount of magnesium hydroxide, at least 1 percent, sufficient to form a solution saturated with magnesium bicarbonate and containing a crystalline magnesium carbonate precipitate, said method involving the steps of carbonating the slurry with sufficient carbon dioxide to dissolve a substantial proportion of the magnesium hydroxide therein as magnesium bicarbonate, continuing carbonation under conditions of temperature, time and pressure such that a solution saturated with magnesium bicarbonate and containing an appreciable amount of a crystalline magnesium carbonate precipitate is formed and substantially all calcium present is precipitated so that the slurry contains dissolved magnesium bicarbonate, the crystalline magnesium carbonate precipitate and a calcium carbonate precipitate, separating crystalline magnesium carbonate and other solids from the slurry to recover a solution saturated or essentially saturated with magnesium bicarbonate, decarbonating the magnesium bicarbonate solution to precipitate hydrous magnesium carbonate therein, and separating hydrous magnesium carbonate from the aqueous phase.

---

4,370,308

## PRODUCTION OF CARBON BLACK

Frank R. Williams, Quincy, Mass., and Ronald C. Hurst, Pampa, Tex., assignors to Cabot Corporation, Boston, Mass.

Filed May 15, 1981, Ser. No. 264,186

Int. Cl.³ C01B 31/02; C09C 1/48

U.S. Cl. 423—450 10 Claims

1. In a modular process for producing furnace carbon blacks wherein a fuel and an oxidant are reacted in a first zone so as to provide a stream of hot primary combustion gases possessing sufficient energy to convert a carbon black-yielding liquid hydrocarbon feedstock to carbon black, and wherein in a second zone the liquid hydrocarbon feedstock is peripherally injected, in the form of a plurality of coherent jets, into the stream of gaseous combustion products in a direction substantially transverse to the direction of flow of the stream of combustion gases and under sufficient pressure to achieve the degree of penetration required for proper shearing and mixing of the feedstock, and wherein in a third zone the feedstock is decomposed and converted into carbon black prior to termination of the carbon forming reaction by quenching, and then cooling, separating and recovering the resultant carbon black, the improvement which comprises introducing into the primary combustion gases at a point no further downstream than the point at which the feedstock is injected a material, in elemental or chemically combined form, selected from the group consisting of calcium, barium and strontium, in an amount sufficient to either increase the surface area of the blacks or increase the throughput of the process.

---

4,370,309

## METHOD FOR REMOVING CARBON BLACK DEPOSITS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 18, 1980, Ser. No. 207,587

Int. Cl.³ C01B 31/02

U.S. Cl. 423—461 23 Claims

1. A method for removing at least a portion of the carbon black deposits on means defining a flow path of an indirected heat exchanger, the carbon black deposits having been laid down by passing a gas stream containing carbon black through the means defining a flow path of the indirect heat exchanger, said method comprising:

selectively introducing additional cleaning carbon black in an amount effective to remove at least a portion of the carbon black deposits into a first portion of the means

defining a flow path and flowing said additional cleaning carbon black along with said gas stream through the means defining a flow path to remove at least a portion of the carbon black deposits therefrom; and

selectively introducing additional cleaning carbon black in an amount effective to remove at least a portion of the carbon black deposits into at least one remaining portion of the means defining a flow path and flowing said additional cleaning carbon black along with said gas stream through the means defining a flow path to remove at least a portion of the carbon black deposits therefrom; wherein at least one of selectively introducing additional cleaning carbon black into said first portion and selectively introducing additional cleaning carbon black into said at least one remaining portion comprises introducing additional cleaning carbon black into said means defining a flow path separately from said gas stream containing carbon black.

---

**4,370,310**

**ZINC ALUMINATE PREPARED USING AN ALUMINA HYDRATE**

**Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jun. 23, 1981, Ser. No. 276,594**
**Int. Cl.³ C01F *7/02***
**U.S. Cl. 423—600** **6 Claims**

1. A method for preparing zinc aluminate comprising the steps of:

wetting particulate alumina hydrate with a suitable dilute acid to form a first paste;

mixing particulate zinc oxide with said first paste to form a second paste; and

calcining said second paste to form said zinc aluminate.

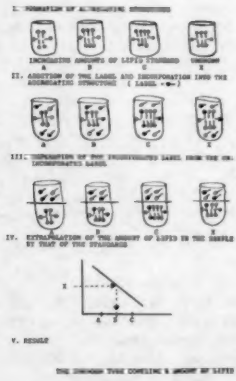
---

**4,370,311**

**LIPID ASSAY BASED ON AGGREGATING PROPERTIES**

**John V. Ilekis, 6950 S. Campbell, Chicago, Ill. 60629**

**Filed Jun. 9, 1981, Ser. No. 271,952**
**Int. Cl.³ G01N *33/92, 33/58***
**U.S. Cl. 424—1.1** **6 Claims**



1. A method for measuring the concentration of a lipid in a supporting fluid as an unknown and comprising:

A. selecting for assay a known volume of the sample containing the lipid for measurement and allowing that selected sample to absorb for test a measured amount of the same lipid in labelled form;

B. preparing a known concentration of the lipid as a standard separate from said selected sample;

C. adding to the separate standard a predetermined amount of the lipid in labelled form and allowing the standard to absorb the labelled lipid;

D. effecting separation of the absorbed and unabsorbed labelled lipid in both the sample and the standard and measuring the amount of lipid so absorbed in each of the sample and standard; and

E. comparing the results of step A to the results of step D to determine if the unknown sample contains more or less or substantially the same as the standard.

---

**4,370,312**

**DECAPEPTIDE**

**Günther Jung, Tübingen; Hans Brückner, Ostfildern/Nellingen, both of Fed. Rep. of Germany; Peter Swetly, Vienna, Austria, and Gerhard Bozler, Biberach an der Riss, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellshaft mit beschrankter Haftung, Biberach an der Riss, Fed. Rep. of Germany**

**Filed Oct. 26, 1981, Ser. No. 315,213**
**Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040824**
**Int. Cl.³ G01N *33/00*; A61K *39/00*; C07C *103/52***
**U.S. Cl. 424—1.5** **6 Claims**

1. The decapeptide of the formula H-Ser-Asp-Leu-Pro-Gln-Thr-His-Ser-Leu-Gly-OH.

---

**4,370,313**

**NITROFURANTOIN DOSAGE FORM**

**William L. Davies, Norwich, N.Y., assignor to Eaton Laboratories, Inc., Manati, P.R.**

**Filed Oct. 26, 1981, Ser. No. 314,656**
**Int. Cl.³ A61K *9/32, 31/345***
**U.S. Cl. 424—32** **3 Claims**

1. A nitrofurantoin dosage form as a tablet containing a salt of nitrofurantoin or a hydrate thereof and excipients therefor enterically coated with an acrylic resin of the class consisting of an anionic polymer synthesized from methacrylic acid and methacrylic acid methyl ester.

---

**4,370,314**

**ORAL COMPOSITION CONTAINING ANTIBACTERIAL AGENT**

**Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.**

**Continuation-in-part of Ser. No. 638,240, Dec. 8, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,202**
**Int. Cl.³ A61K *7/22***
**U.S. Cl. 424—54** **18 Claims**

1. A packaged oral composition comprising an aqueous-humectant oral vehicle, a nitrogen-containing quaternary ammonium antibacterial antiplaque agent whose use has been observed to lead tc staining of dental surfaces and an additive which reduces such staining consisting essentially of an additive selected from the group consisting of alkali metal hexametaphosphate and mixture of alkali metal hexametaphosphate and alkali metal bicarbonate.

---

**4,370,315**

**POST-DEPILATORY COMPOSITION REDUCING PROGRESSIVELY THE GROWTH OF BODY HAIR**

**Daniel Greff, Plaisir; Françoise Petit-Martenon, Paris, and Tran Toan, La Verriere, all of France, assignors to Sederma, Meudon, France**

**Filed Feb. 22, 1978, Ser. No. 879,929**
**Claims priority, application France, Feb. 22, 1977, 77 05158**
**Int. Cl.³ A61K *37/48***
**U.S. Cl. 424—94** **6 Claims**

1. A process to treat man or other living animals to slow down new growth of body hair after depilation which comprises applying to parts of man or living animals where removal of body hair is desired in an amount and at a frequency

sufficient to retard new hair growth a cosmetic preparation consisting essentially of a cosmetic cream, ointment, milk or lotion having incorporated therein at least one lipoxygenase in an amount such that the total lipoxygenase enzyme activity is from 250,000 to 1,000,000 units per 100 grams of said cosmetic preparation and linoleic acid or derivative thereof in amount of 0.5 to 3% of mass of said cosmetic preparation.

---

**4,370,316**

## PHARMACEUTICAL COMPOSITION COMPRISING EXTRACT FROM POISON POUCH CONTENTS OF BEE USEFUL FOR TREATING DECREASED IMMUNITY

**Isamu Saikawa; Takashi Yasuda; Shohachi Murakami, all of Toyama; Toyoo Maeda, Kanazawa; Akira Yotsuji, Toyama; Masahiro Takahata, Toyama; Hisatsugu Tsuda, Toyama; Hidetada Mikami; Hiroshi Sakai, both of Takaoka, and Toshinori Ohashi, Hitachi, all of Japan, assignors to Toyama Chemical Company, Ltd., Tokyo, Japan**

**Filed May 7, 1980, Ser. No. 147,530**

**Claims priority, application Japan, May 10, 1979, 54-57461**

**Int. Cl.³ A61K** *35/58*

**U.S. Cl. 424—98** **1 Claim**

1. A method for treating a host mammal having a decreased immunity, comprising administering to said host mammal an immunostimulating effective amount of the deproteinized extract from the poison pouch contents of bee B-T.

---

**4,370,317**

## PANCREATIC SPASMOLYTIC POLYPEPTIDE

**Klavs H. Jorgensen, Virum; Karin D. Jorgensen, Vedbaek, and Lars Thim, Gentofte, all of Denmark, assignors to Novo Industri A/S, Denmark**

**Continuation-in-part of Ser. No. 185,796, Sep. 10, 1980, abandoned. This application Mar. 9, 1981, Ser. No. 241,851**

**Int. Cl.³ A61K** *37/00*

**U.S. Cl. 424—177** **11 Claims**

1. A polypeptide exhibiting the following amino acid composition:

pyrGlu-Lys-Pro-Ala-Ala-Cys-Arg-Cys-Ser-Arg-
1 5 10

-Gln-Asp-Pro-Lys-Asn-Arg-Val-Asn-Cys-Gly-
15 20

-Phe-Pro-Gly-Ile-Thr-Ser-Asp-Gln-Cys-Phe-
25 30

-Thr-Ser-Gly-Cys-Cys-Phe-Asp-Ser-Gln-Val-
35 40

-Pro-Gly-Val-Pro-Trp-Cys-Phe-Ser-Pro-Leu-
45 50

-Pro-Ala-Gln-Glu-Ser-Glu-Glu-Cys-Val-Met-
55 60

-Gln-Val-Lys-Ala-Arg-Lys-Asn-Ser-Gly-Tyr-
65 70

-Pro-Gly-Ile-Cys-Pro-Glu-Asp-Cys-Ala-Ala-
75 80

-Arg-Asn-Cys-Cys-Phe-Ser-Asp-Thr-Ile-Pro-
85 90

-Glu-Val-Pro-Trp-Cys-Phe-Phe-Pro-Met-Ser-
95 100

-Val-Glu-Asp-Cys-His-Tyr
105

wherein pyrGlu (residue 1) stands for pyroglutamic acid, and the physiologically acceptable salts thereof.

---

**4,370,318**

## BESTATIN-RELATED COMPOUNDS AS IMMUNOPOTENTIATOR

**Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Takaaki Aoyagi, Fujisawa; Kenji Kawamura, Zama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan**

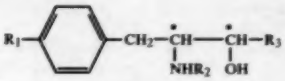
**Filed Jun. 10, 1981, Ser. No. 272,211**

**Claims priority, application Japan, Jul. 7, 1980, 55/91690; Jul. 7, 1980, 55/91691; Jul. 7, 1980, 55/91692**

**Int. Cl.³ A61K** *37/00, 31/16, 31/165*

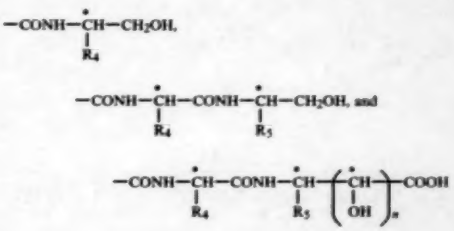
**U.S. Cl. 424—177** **12 Claims**

1. A new compound of the general formula



(III)

wherein $R_1$ is a hydrogen atom or a hydroxyl group, $R_2$ is a hydrogen atom or an alkanoyl group of 2–7 carbon atoms or an alkoxycarbonyl group of 2–7 carbon atoms, and $R_3$ is selected from the groups:



where $R_4$ and $R_5$ may be the same or different from each other and each is an alkyl group of 1–7 carbon atoms, a hydroxyalkyl group of 1–7 carbon atoms, a mercaptoalkyl group of 1–7 carbon atoms, a carboxamidoalkyl group of 2–8 carbon atoms, an aminoalkyl group of 1–7 carbon atoms, a guanidyl-N-alkyl group of 1–7 carbon atoms, an alkylmercaptoalkyl group of 2–7 carbon atoms, a carboxyalkyl group of 2–8 carbon atoms, an aryl group, particularly phenyl, an aralkyl group of 7–8 carbon atoms or a substituted aralkyl group of 7–8 carbon atoms, n is zero or 1, and the asterisk (*) denotes the R-configuration or S-configuration or a combination thereof.

---

**4,370,319**

## SKIN CONDITIONING COMPOSITIONS

**Carole N. Chapin; Gary R. Keim, and David L. Shelton, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 161,173, Jun. 19, 1980, abandoned. This application Mar. 20, 1981, Ser. No. 245,827**

**Int. Cl.³ A61K** *31/695, 47/00*

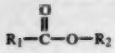
**U.S. Cl. 424—184** **11 Claims**

1. A skin conditioning composition comprising:

(A) from about 0.1% to about 5% of an alkali metal phosphoric acid ester of a glyceride selected from the group consisting of a monoglyceride, a diglyceride and mixtures thereof.

(B) from about 0.1% to about 5% of a non-volatile silicone fluid.

(C) from about 0.1% to about 16% of an ester, or mixtures thereof, having the structural formula



wherein $R_1$ and $R_2$ are both straight chain alkyls having from about 6 to about 22 carbon atoms and the total number of carbon atoms in the ester is at least about 24;

(D) an emollient selected from the group consisting of fatty alcohols, esters having fewer than about 24 carbon atoms, branched chain esters having greater than about 24 total carbon atoms, squalane, liquid or solid paraffins, mixtures of fatty acids and squalane, mixtures of fatty acids and liquid or solid paraffins and mixtures thereof in an amount such that the amount of ester plus emollient is from about 0.2% to about 25%;

(E) from about 0.05% to about 8% of an emulsifier selected from the group consisting of polyethoxylated fatty acids having less than about 30 moles of ethylene oxide per mole of fatty acid, ethoxylated esters, unethoxylated sugar esters, polyoxyethylene fatty ether phosphates, fatty acid amides, phospholipids, polypropoxylated fatty ethers, acyl lactylate salts, polyethoxylated poly (oxypropylene) glycols, polypropoxylated poly(oxyethylene) glycols, poly (oxyethylene) poly (oxypropylene) ethylene diamines, soaps, provided the level of soap is less than about 1.6%, and mixtures thereof; and

(F) water.

---

## 4,370,320

## (THIONO) (THIOL) PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES OF SUBSTITUTED 4-HYDROXYQUINOLINES AND THEIR USE AS AGENTS FOR COMBATING PESTS

**Horst Gildemeister, Wiesbaden; Hilmar Mildenberger, Kelkheim; Werner Knauf, Frankfurt am Main; Anna Waltersdorfer, Frankfurt am Main, and Burkhard Sachse, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

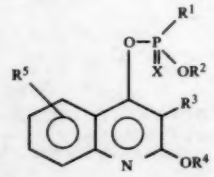
**Filed Sep. 18, 1981, Ser. No. 303,475**

**Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035650**

**Int. Cl.**[3] **A61K** *31/675;* **C07D** *215/56*

**U.S. Cl. 424—200** **6 Claims**

1. A compound of the formula I



(I)

in which $R^1$ denotes ($C_1$–$C_4$)-alkyl, ($C_1$–$C_4$)-alkoxy, ($C_1$–$C_4$)-alkylmercapto, ($C_1$–$C_4$)-alkylamino, ($C_1$–$C_4$)-dialkylamino or phenyl, $R^2$ denotes ($C_1$–$C_4$)-alkyl, $R^3$ denotes hydrogen, halogen, COOalkyl, CONH(alkyl) or $CON(alkyl)_2$ with in each case 1-4 C atoms per alkyl radical, or cyano, $R^4$ denotes ($C_1$–$C_4$)-alkyl, $R^5$ denotes hydrogen, halogen, nitro, ($C_1$–$C_4$)-alkyl, ($C_1$–$C_4$)-alkoxy or trihalogenomethyl and X denotes oxygen or sulfur.

5. A method for combatting insects, acarids or fungi which comprises contacting insects, acarids or fungi with an insecticidally, acaricidally or fungicidally effective amount of a compound defined in claim 1.

## 4,370,321

## PROGESTATIONAL ADJUVANT THERAPY

**Martin O. Greaney, and Merritt R. Callantine, both of Evansville, Ind., assignors to Mead Johnson and Company, Evansville, Ind.**

**Filed Sep. 1, 1976, Ser. No. 719,558**

**Int. Cl.**[3] **A61K** *31/56*

**U.S. Cl. 424—243** **9 Claims**

1. The adjuvant method of treatment of breast cancer after mastectomy which consists essentially of administering an effective non-toxic metastasis preventing oral or parenteral dose of a 17α-acyloxy-6-methylpregna-4,6-diene-3,20-dione having up to 10 carbon atoms in the acyloxy group to a mastectomized mammal said mammal being diagnostically free of mammary carcinoma on a continuing repetitive regimen during a treatment period after mastectomy when the danger of metastatic transmission or recurrence of said cancer exists wherein at the time of mastectomy said mammal had no metastases outside of the curable area of breast and axilla and had positive axillary lymph nodes.

---

## 4,370,322

## TOPICALLY ADMINISTRABLE PHARMACEUTICAL COMPOSITIONS CONTAINING ANTI-INFLAMMATORY STEROIDS

**Michael J. Busse, Harrow, and Kenneth A. Lees, Northwood, both of England, assignors to Glaxo Group Limited, London, England**

**Filed Oct. 5, 1981, Ser. No. 308,581**

**Claims priority, application United Kingdom, Oct. 6, 1980, 8032111**

**Int. Cl.**[3] **A61K** *31/56*

**U.S. Cl. 424—243** **14 Claims**

1. A pharmaceutical composition comprising an anti-inflammatory steroid selected from beclomethasone 17,21-dipropionate, betamethasone 17-valerate, betamethasone 17,21-dipropionate, clobetasol 17-propionate, clobetasone 17-butyrate and chloromethyl 17α-acetoxy-9α-fluoro-11β-hydroxy-16β-methyl-3-oxoandrosta-1,4-diene-17β-carboxylate dissolved in a liquid oily phase containing at least one oil possessing a viscosity less than 10 centistokes and in which the steroid has a solubility of at least 0.5% by weight at 25° C., being the degree of unsaturation of the steroid in the liquid oily phase of the composition at 25° C. being at least 3.

---

## 4,370,323

## 2-CYANOAZIRIDINYL-(1)-2-SUBSTITUTED-AZIRIDINYL-(1)-METHANES

**Wolfgang Kampe, Heddesheim; Max Thiel, Mannheim; Erich Fauland, Mannheim-Gartenstadt; Uwe Bicker, Mannheim, and Gottfried Hebold, Mannheim-Vogelstang, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany**

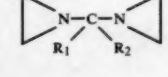
**Filed Mar. 9, 1977, Ser. No. 776,068**

**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610156**

**Int. Cl.**[3] **C07D** *403/06, 403/14, 401/14;* **A61K** *31/395*

**U.S. Cl. 424—244** **12 Claims**

1. A 2-cyanoaziridinyl-(1)-2-substituted-aziridinyl-(1)-methane of the formula



wherein

R is a nitrile or carbamoyl group, and

$R_1$ and $R_2$, which can be the same or different, are hydrogen atoms, alkoxycarbonyl, the alkoxy moiety having up to 6 carbon atoms, or aliphatic hydrocarbon radicals contain-

ing up to 10 carbon atoms, which can be straightchained, branched or cyclic, or $R_1$ and $R_2$ together with the carbon atom to which they are attached form a carbocyclic ring containing up to 8 ring members.

5. A method for stimulating the immune response of an animal patient which comprises administering to said patient an effective amount of one of the following compounds

2-(2-cyanoaziridinyl-(1))-2-(2-carbamoylaziridinyl-(1))-propane,

1-(2-cyanoaziridinyl-(1))-1-(2-carbamoylaziridinyl-(1))-1-cyclopropyl-ethane,

ethyl α-(2-cyanoaziridinyl-(1))-α-(2-carbamoylaziridinyl(1))-propionate,

diethyl 1-(2-cyanoaziridinyl-(1))-1-(2-carbamoylaziridinyl-(1))-2-methyl-propane,

2-(2-cyanoaziridinyl-(1))-2-(2-carbamoylaziridinyl(1))-n-hexane,

1-(2-cyanoaziridinyl-(1))-1-(2-carbamoylaziridinyl(1))-propane,

4-(2-cyanoaziridinyl-(1))-4-(2-carbamoylaziridinyl-(1))-n-heptane, and

1,1-bis-(2-cyanoaziridinyl-(1))-cyclohexane.

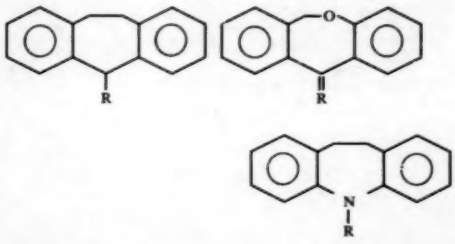
---

## 4,370,324
## METHOD AND COMPOSITION FOR TREATING AND PREVENTING IRRITATION OF THE EYES

Joel E. Bernstein, 615 Brierhill Rd., Deerfield, Ill. 60015

Filed Sep. 17, 1980, Ser. No. 188,249
Int. Cl.³ A61K *43/00, 31/335, 31/135*
U.S. Cl. 424—244 16 Claims

1. A method of preventing irritation of the mucous membrane of the eye caused by allergies, chemical pollutants, or physical irritants manifested by redness, tearing, burning discomfort or itching comprising applying topically to said eye a therapeutically effective amount of a tricyclic anti-depressant selected from the group consisting of:



wherein R is an aliphatic secondary or tertiary amine wherein the aliphatic chain is a three carbon chain connected to a nitrogen atom with the tertiary amine having two carbon atoms attached to the nitrogen atom in addition to the aliphatic chain and the secondary amine having one carbon atom attached to the nitrogen atom in addition to the aliphatic chain.

---

## 4,370,325
## PHARMACEUTICAL COMPOSITIONS AND METHOD OF TREATMENT

Albert M. Packman, Dresher, Pa., assignor to Dermik Laboratories, Fort Washington, Pa.

Filed Mar. 30, 1979, Ser. No. 25,388
Int. Cl.³ A61K *31/555*
U.S. Cl. 424—245 18 Claims

1. An ophthalmic and otic composition for treating eye and ear irritations and inflammation in warm blooded animals which comprises about 0.001 to about 5% by weight of the total composition of at least a compound selected from the group consisting of bis-(2-pyridyl-1-oxide) disulfide and the adducts of bis-(2-pyridyl-1-oxide) disulfide having the empirical formula:

$$(C_5H_4NOS)_2MY_t \quad (I)$$

wherein M represents a member selected from the group consisting of zinc, iron, magnesium, tin, cadmium, zirconium, alkali and alkaline earth metals; Y is the anion of an inorganic or organic acid and t is either 1 or 2, together with a suitable isotonic pharmaceutical carrier.

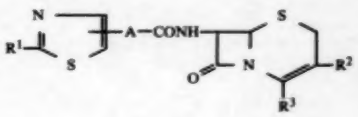
---

## 4,370,326
## CEPHEM COMPOUNDS AND COMPOSITION

Takao Takaya, Sakai, and Zenzaburo Tozuka, Toyonaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 6, 1978, Ser. No. 939,982
Claims priority, application United Kingdom, Sep. 13, 1977, 38163/77; Oct. 11, 1977, 42315/77
Int. Cl.³ C07D *501/22;* A61K *31/545*
U.S. Cl. 424—246 13 Claims

1. A compound of the formula:



wherein

$R^1$ is amino or protected amino,

A is lower alkylene which may be substituted with oxo, hydroxy, amino, protected hydroxy or protected amino,

$R^2$ is hydrogen, and

$R^3$ is carboxy or functionally modified carboxy, and its nontoxic, pharmaceutically acceptable salt.

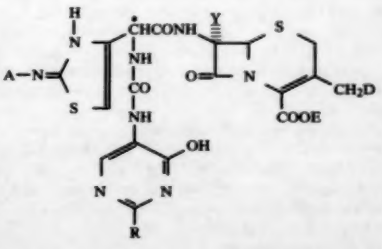
---

## 4,370,327
## CEPHALOSPORINS AND PHARMACEUTICAL COMPOSITIONS

Bernd Wetzel; Eberhard Woitun, both of Biberach; Wolfgang Reuter, Laupertshausen; Roland Maier, Biberach; Uwe Lechner, Ummendorf, and Hanns Goeth, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

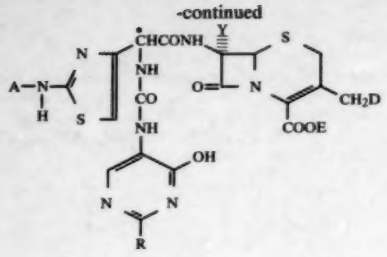
Filed Feb. 23, 1981, Ser. No. 237,066
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007685
Int. Cl.³ C07D *501/22, 501/36, 501/46, 501/57*
U.S. Cl. 424—246 10 Claims

1. A compound of the tautomeric formulas

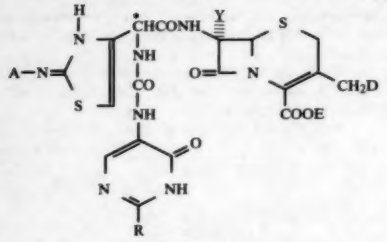


(I)

-continued

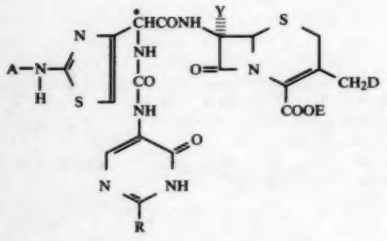


(I')



(I'')

and



(I''')

wherein

A is a hydrogen atom or a $-COCH_2Cl$, $-COCH_2Br$, $-COOCH_2CCl_3$, formyl, or trityl group;

Y, which is in the α-configuration, represents a hydrogen atom or a methoxy group;

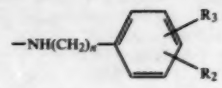
D is a hydrogen atom, an acetoxy, aminocarbonyloxy, pyridinium, or aminocarbonyl-pyridinium group, or the group S-Het, where Het is tetrazol-5-yl, 1-methyl-tetrazol-5-yl, 1,3,4-thiadiazol-5-yl, 2-methyl-1,3,4-thiadiazol-5-yl, or 1,2,4-thiadiazol-5-yl group;

R represents a hydrogen atom; or cyclopropyl, hydroxyl, or methoxy group; a group of general formula $-NHR_1$, where $R_1$ represents a hydrogen atom, an aliphatic branched or unbranched hydrocarbon group of from 1 to 6 carbon atoms, optionally containing a double or triple bond, or a cycloalkyl group of from 3 to 6 carbon atoms; a group of general formula —NH—Z—X, wherein

Z represents a linear or branched alkylene group of from 1 to 4 carbon atoms or a cycloalkyl group substituted by the substituent X and having from 3 to 6 carbon atoms; and

X represents a hydroxyl, mercapto, cyano, aminocarbonyl, aminosulfonyl, acetyl, amino, methylamino, dimethylamino, formylamino, acetylamino, ureido, methylsulfonylamino, methoxy, ethoxy, acetoxy, methylmercapto, methylsulfinyl, methylsulfonyl, carboxyl, or methoxycarbonyl group; or

a group of general formula



(Ia)

wherein

n represents the integer 0 to 1 and $R_2$ and $R_3$, which may be the same or different, each represent a hydrogen or halogen atom or a hydroxyl, methyl, methoxy, acetylamino, aminocarbonylamino, alkylaminocarbonylamino, dialkylaminocarbonylamino, alkylsulfonylamino, alkylcarbonyl, alkylcarbonyloxy, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, nitro, cyano, methylmercapto, alkylsulfinyl, alkylsulfonyl, aminosulfonyl, alkylaminosulfonyl, or dialkylaminosulfonyl group, wherein the alkyl moieties may each comprise from 1 to 3 carbon atoms; and

E is a hydrogen atom or a protective group which is easily removable in vitro or in vivo,

or, when E is a hydrogen atom, a non-toxic, pharmacologically acceptable salt thereof with an inorganic or organic base.

9. The method of inhibiting the growth of or destroying pathogenic bacteria in a warm-blooded animal in need thereof, which comprises perorally, parenterally, rectally, or topically administering to said animal an effective antibiotic amount of a compound of claim 1.

---

**4,370,328**

## CARDIAC STIMULANT 1-(3- OR 4-SUBSTITUTED PIPERIDINO)PHTHALAZINES

**Simon F. Campbell, Kingsdown; John C. Danilewicz, Ash, Nr. Canterbury; Allan L. Ham, Broadstairs, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.**

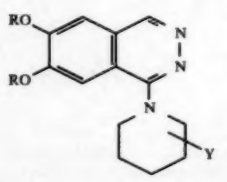
**Continuation-in-part of Ser. No. 34,653, Apr. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 953,557, Oct. 23, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,777**

**Claims priority, application United Kingdom, Nov. 3, 1977, 45670/77; Mar. 28, 1979, 7910843**

**Int. Cl.**[3] **C07D** *237/30*

**U.S. Cl. 424—250** **14 Claims**

1. A compound of the formula:



(I)

wherein

R is a $C_{1-6}$ alkyl group;

and Y is attached to the 3- or 4-position of the piperidino ring and represents a group of the formula:

$$-X-(CHR^1)_m-Z$$

wherein

$R^1$ is selected from the group consisting of hydrogen and $C_{1-6}$ alkyl;

m is 1 or 2, with the proviso that when m is 2, each $R^1$ may be the same or different;

X is selected from the group consisting of oxygen and a direct link, with the proviso that when m is 1, X is a direct link; and

Z is selected from the group consisting of $-OCONR^4R^5$, $N(R^2)SO_2NR^4R^5$, $-N(R^2)COR^3$, $-N(R^2)SO_2R^3$, $-N(R^2)CONR^4R^5$, $N(R^2)SOR^3$, and $-N(R^2)COOR^3$;

wherein $R^2$ and $R^5$ are each independently selected from the group consisting of hydrogen and $C_{1-6}$ alkyl; $R^3$ is selected from the group consisting of $C_{1-6}$ alkyl, benzyl, $C_{3-7}$ cycloalkyl, phenyl, phenethyl and pyridyl; and $R^4$ is selected from the group consisting of hydrogen and $R^3$, provided that when X is a direct link, $R^3$ or $R^4$ is $C_{3-7}$ cycloalkyl;

and the pharmaceutically-acceptable acid addition salts thereof.

---

**4,370,329**

## PIPERAZINE DERIVATIVES AS CIRCULATION-ENHANCING SUBSTANCES

**Arthur Scherm, Bad Homburg, and Dezsoe Peteri, Hattersheim, both of Fed. Rep. of Germany, assignors to Merz & Company, Frankfurt, Fed. Rep. of Germany**

**Filed Aug. 22, 1980, Ser. No. 181,189**

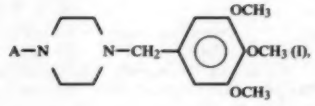
**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934450; Aug. 25, 1979, 2934488**

**Int. Cl.³ A01K** *31/495;* **C07D** *295/08*

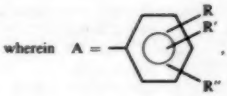
**U.S. Cl. 424—250** **18 Claims**

1. A compound selected from the group consisting of

(a) N-(trimethoxybenzyl)-N′-phenylpiperazines having the formula:



(I),



wherein

R is trifluoromethyl, hydroxy, nitro, halogen, lower-alkyl, or lower-alkoxy;

R′ is hydrogen, trifluoromethyl, halogen, lower-alkyl, or lower-alkoxy;

R″ is hydrogen or lower-alkoxy,

or wherein R and either R′ or R″ together stand for lower-alkylene dioxy,

the substituents R, R′, and R″ in A, when A is disubstituted or trisubstituted, being diloweralkyl, diloweralkoxy, lower-alkylenedioxy, ditrifluoromethyl, triloweralkoxy, or trifluoromethylhalo, and the substituent R in A, when A is monosubstituted, being fluoro, trifluoromethyl, nitro, or hydroxy,

and

(b) acid addition salts thereof.

2. A pharmaceutical composition suitable for use in the enhancement or stimulation of circulation, comprising a compound of claim 1 in an amount effective for such purpose, in association with a pharmaceutical carrier.

---

**4,370,330**

## METHOD OF ENHANCING CIRCULATION WITH PIPERAZINES

**Arthur Scherm, Bad Homburg, and Dezsoe Peteri, Hattersheim, both of Fed. Rep. of Germany, assignors to Merz & Company, Frankfurt, Fed. Rep. of Germany**

**Division of Ser. No. 181,189, Aug. 22, 1980. This application Oct. 5, 1981, Ser. No. 308,607**

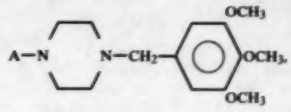
**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934450; Aug. 25, 1979, 2934488**

**Int. Cl.³ A61K** *31/495;* **C07D** *295/08*

**U.S. Cl. 424—250** **36 Claims**

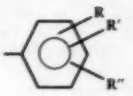
1. Method for the treatment of a subject in need of enhancement or stimulation of circulation, comprising the step of administering to the subject a circulation-enhancing amount of a compound selected from the group consisting of

(a) N-(trimethoxybenzyl)-N′-phenylpiperazines having the formula:



(I)

wherein A =



wherein

R is trifluoromethyl, hydroxy, nitro, halogen, lower-alkyl, lower-alkoxy, or hydrogen;

R′ is hydrogen, trifluoromethyl, halogen, lower-alkyl, or lower-alkoxy;

R″ is hydrogen or lower-alkoxy,

or wherein R and either R′ or R″ together stand for lower-alkylene dioxy, and

(b) pharmaceutically-acceptable acid addition salts thereof.

---

**4,370,331**

## L-GLAUCINE CONTAINING COMPOSITION FOR COUGH RELIEF

**Alfred G. Maasböl, Hamburg, Fed. Rep. of Germany, assignor to Karl O. Helm Aktiengesellschaft, Hamburg, Fed. Rep. of Germany**

**Continuation of Ser. No. 895,718, Apr. 12, 1978, abandoned. This application May 16, 1980, Ser. No. 151,197**

**Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717062**

**Int. Cl.³ A61K** *31/47*

**U.S. Cl. 424—258** **22 Claims**

1. An antitussive composition comprising a pharmaceutically-acceptable carrier and from about 4 to about 99 percent by weight of a glaucine compound selected from the group consisting of l-glaucine, d,l-glaucine, the physiologically-acceptable salts thereof, and mixtures thereof.

---

**4,370,332**

## 1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATIVES AND THE PREPARATION THEREOF

**Teiji Kishimoto, Kawanishi; Hiromu Kochi, Sakai, and Yoshiyuki Kaneda, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

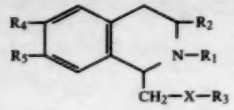
**Division of Ser. No. 67,393, Aug. 17, 1979, Pat. No. 4,292,320, which is a continuation of Ser. No. 695,975, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 489,993, Sep. 19, 1974, Pat. No. 3,978,063. This application Oct. 29, 1980, Ser. No. 201,997**

**Claims priority, application Japan, Jul. 30, 1973, 47-85987**

**Int. Cl.³ A61K** *31/47;* **C07D** *409/12*

**U.S. Cl. 424—258** **8 Claims**

8. A pharmaceutical composition comprising, as an active ingredient, at least one 1,2,3,4-tetrahydroisoquinoline having the formula:



wherein $R_1$ and $R_2$ are each hydrogen or lower alkyl, $R_3$ is thiadiazolyl optionally substituted by a lower alkyl group, $R_4$ and $R_5$ are each hydroxy or a protected hydroxy and X is —O— or —S—, and pharmaceutically acceptable salts thereof, with a pharmaceutically acceptable carrier.

---

**4,370,333**

**17-CYCLOPROPYLMETHYL-3-HYDROXY-14-METHOXY 7α-METHYL-MORPHINAN-6-ONE AND THERAPEUTIC METHOD OF TREATING PAIN WITH IT**

**Anil C. Ghosh, Lexington, and Raj K. Razdan, Belmont, both of Mass., assignors to SISA, Incorporated, Cambridge, Mass.**

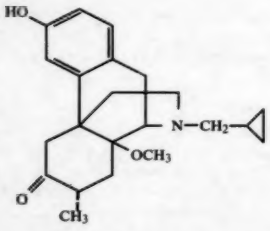
**Filed Jun. 29, 1981, Ser. No. 278,760**

**The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.**

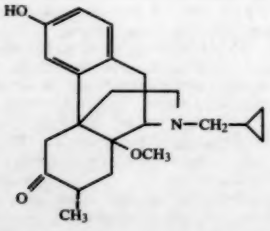
**Int. Cl.**[3] **A61K** *31/485;* **C07D** *221/28*

**U.S. Cl. 424—260** **6 Claims**

1. 17-Cyclopropylmethyl-3-hydroxy-14-methoxy-7α-methyl-morphinan-6-one characterized by the structural formula:



4. A therapeutic method for treating pain without liability of drug dependence in an individual for whom such therapy is indicated which method comprises administering to the individual an effective analgesic amount of a compound characterized by the formula:



---

**4,370,334**

**1,4-DIHYDRO-PYRIDINE DERIVATIVES AND METHODS OF USING SAME**

**Yoshinari Sato, Takaishi, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

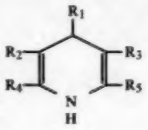
**Division of Ser. No. 39,752, May 17, 1979, Pat. No. 4,284,634, which is a continuation-in-part of Ser. No. 809,788, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 701,994, Jul. 1, 1976, Pat. No. 4,145,432. This application Dec. 4, 1980, Ser. No. 213,048**

**Claims priority, application United Kingdom, Jul. 2, 1975, 27945/75; Sep. 29, 1975, 39854/75; Dec. 16, 1975, 51524/75; Apr. 5, 1976, 13761/76; Dec. 17, 1976, 52720/76; Jun. 6, 1978, 26429/78; Oct. 10, 1978, 39978/78**

**Int. Cl.**[3] **C07D** *213/55;* **A61K** *31/455*

**U.S. Cl. 424—266** **30 Claims**

1. A compound of the formula:



wherein

$R_1$ is unsubstituted phenyl phenyl monosubstituted with halogen, nitro, hydroxy, trifluoromethyl, halo(lower)alkyl, lower alkyl, lower alkoxy, lower alkenyloxy, cyano, lower alkoxycarbonyl or lower alkylsulfamoyl, disubstituted phenyl selected from 2-chloro-5-nitro, 2,4- or 3,4-dichloro and 3,4-dimethoxy, thienyl or furyl,

$R_2$ is lower alkoxycarbonyl, and $R_3''$ is lower alkoxycarbonyl, lower alkoxy(lower)alkoxycarbonyl, hydroxy(lower)alkoxycarbonyl, phenyl(lower)alkoxycarbonyl, phenyl(lower)alkoxy(lower)alkoxycarbonyl, phenoxy(lower)alkoxycarbonyl, N,N-di-(lower)alkylamino(lower)alkoxycarbonyl or N-(lower)alkyl-N-phenyl(lower)alkylamino(lower)alkoxycarbonyl,

$R_4$ is oxo-substituted lower alkyl, and

$R_5$ is hydrogen; lower alkyl; or oxo-substituted lower alkyl.

---

**4,370,335**

**ANTISECRETORY 4-DIPHENYLMETHYL-1-[(OXOALKYL)IMINO]METHYL-PIPERIDINES AND THEIR DERIVATIVES**

**Malcolm K. Scott, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.**

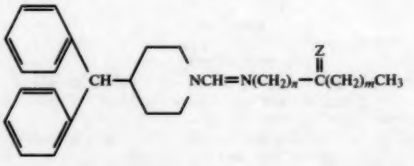
**Filed Feb. 2, 1982, Ser. No. 345,128**

**Int. Cl.**[3] **A61K** *31/445;* **C07D** *405/12*

**U.S. Cl. 424—267** **10 Claims**

1. 4-Diphenylmethyl-1-[(oxoalkyl)imino]methyl-piperidine or a derivative thereof of the formula:

(II)



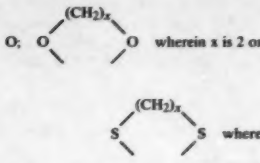
wherein:

n is an integer from 1–10, inclusive

m is an integer from 0–9, inclusive

n+m=1–10

Z is selected from the following:




$(OR)_1)_2$ wherein $R_1$ is $C_{1-6}$ loweralkyl; NOH; and H,OH;

or a pharmaceutically acceptable acid addition salt thereof.

9. A pharmaceutical composition comprising an effective gastric acid secretion inhibiting amount of 4-diphenylmethyl-1-[(oxoalkyl)imino]methyl-piperidines and their derivatives compound of claim 1, in free base or acid addition salt form together with a pharmaceutically acceptable carrier.

---

**4,370,336**

## 3,5-DISUBSTITUTED-1H-1,2,4-TRIAZOLE DERIVATIVES AS ANTIFERTILITY AGENTS

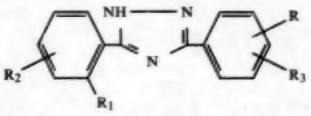
**Amedeo Omodei-Sale, Voghera; Pietro Consonni, Milan; Giulio Galliani, Monza, and Leonard Lerner, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy**

**Division of Ser. No. 47,411, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 11,297, Feb. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 897,313, Apr. 18, 1978, abandoned. This application Apr. 16, 1981, Ser. No. 254,729**

**Int. Cl.³ A61K** *31/41;* **C07D** *249/08*

**U.S. Cl. 424—269** **2 Claims**

1. A method for preventing littering in an impregnated female animal which comprises administering to said animal an effective amount of a compound of the following formula




I

wherein R represents hydrogen, $(C_{1-4})$alkyl, $(C_{1-4})$alkoxy, allyloxy, propargyloxy, trifluoromethyl, phenyl, fluoro, chloro or dimethylamino; $R_1$ represents a $(C_{1-4})$alkyl group; $R_2$ represents hydrogen, fluoro, chloro, $(C_{1-4})$alkyl, methoxy or ethoxy; $R_3$ represents hydrogen, fluoro, chloro, $(C_{1-4})$alkyl or $(C_{1-4})$alkoxy; R and $R_2$ taken together represent a methylenedioxy group; with the proviso that, when R, $R_2$ and $R_3$ all represent hydrogen, $R_1$ cannot be methyl; with the further proviso that, when $R_2$ and one of R and $R_3$ represent hydrogen, $R_1$ and the other of R and $R_3$ cannot simultaneously represent methyl; or a salt thereof with a pharmaceutically acceptable acid.

---

**4,370,337**

## 1,2,4-TRIAZOLE DERIVATIVES AS ANTIFERTILITY AGENTS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

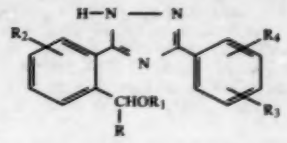
**Amedeo Omodei-Sale', Voghera-Pavia; Pietro Consonni, Milan, and Giulio Galliani, Monza, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy**

**Division of Ser. No. 87,376, Oct. 23, 1979. This application Jul. 16, 1980, Ser. No. 283,715**

**Int. Cl.³ A61K** *31/41;* **C07D** *249/08*

**U.S. Cl. 424—269** **1 Claim**

1. A method for preventing reproduction in a warm-blooded animal which comprises administering to the animal a dosage from about 0.8 to about 50 mg/Kg of body weight of a compound of the formula




wherein R represents hydrogen or methyl, $R_1$ represents hydrogen or $(C_1–C_4)$ alkyl, or R and $R_1$ taken together represent a further bond between the carbon and the oxygen atom, $R_2$ represents hydrogen, chloro, fluoro, bromo, $(C_1–C_4)$ alkyl or $(C_1–C_4)$ alkoxy, $R_3$ represents $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, allyloxy, propargyloxy, trifluoromethyl, phenyl, chloro, fluoro, bromo or dimethylamino and $R_4$ represents hydrogen, chloro, fluoro, bromo, $(C_1–C_4)$ alkyl or $(C_1–C_4)$ alkxoy or $R_3$ and $R_4$ taken together represent a methylenedioxy group.

---

**4,370,338**

## MEDICAMENT BASED ON 2-AMINO-6-TRIFLUOROMETHOXY-BENZOTHIAZOLE

**Jacques Mizoule, Villeneuve la Garenne, France, assignor to Pharmindustrie, Gennevilliers, France**

**Filed Oct. 5, 1981, Ser. No. 308,695**

**Claims priority, application France, Oct. 17, 1980, 80 22218**

**Int. Cl.³ A61K** *31/425*

**U.S. Cl. 424—270** **7 Claims**

1. A medicament, particularly useful as an anticonvulsant, anxiolytic and hypnotic, which contains a pharmaceutically acceptable vehicle and, as active substance, 1 to 50 mg per unit dose of 2-amino-6-trifluoromethoxy-benzothiazole or a salt of this compound with a pharmaceutically acceptable acid.

---

**4,370,339**

## METHOD FOR TREATING INFLAMMATORY CONDITIONS

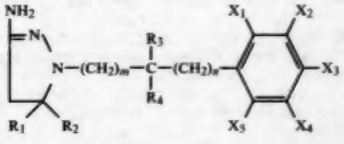
**Fortuna Haviv, Deerfield; Robert W. DeNet, Waukegan, and William A. Boulanger, Urbana, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed Sep. 14, 1981, Ser. No. 301,475**

**Int. Cl.³ A61K** *31/415*

**U.S. Cl. 424—273 P** **6 Claims**

1. A method for treating an inflammatory condition in a mammalian patient which comprises administering to a patient requiring such treatment an effective amount of a compound having the formula




or a pharmaceutically acceptable acid addition salt thereof, wherein:

m and n are integers ranging from 0 to 6,

$R_1$, $R_2$, $R_3$, $R_4$ and $R_5$, which can be the same or different, are hydrogen or lower alkyl,

$X_1$, $X_2$, $X_3$, $X_4$ and $X_5$, which can be the same or different, are hydrogen, halogen, alkyl, cycloalkyl, alkoxy, alkanoyloxy, haloalkyl, phenyl, phenoxy, benzoyloxy, mercaptoalkyl, amino, alkylamine, hydroxyl, nitro, and nitrile,

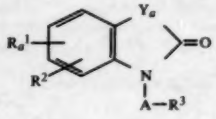
each of $X_1$–$X_5$, when they contain carbon, having not more than 6 carbon atoms.

## 4,370,340
## BENZOTHIAZOL-2-ONE-3-ALKANOIC ACIDS AND ESTERS AND ALDOSE REDUCTASE INHIBITING COMPOSITIONS THEREOF

**Ikuo Ueda; Masaaki Matsuo, both of Toyonaka; Susumu Satoh, Ikeda, and Takao Watanabe, Mukou, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

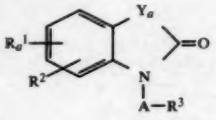
**Filed Jun. 2, 1980, Ser. No. 155,185**
**Claims priority, application Japan, Jun. 12, 1979, 54-74239**
**Int. Cl.³ C07D *277/68;* A61K *31/425***
**U.S. Cl. 424—274** **4 Claims**

1. A compound of the formula:



wherein
$R_a^1$ is halogen, nitro, amino, ($C_3$ to $C_8$)cycloalkyl, phenyl or phenoxy
$R^2$ is halogen or $C_1$–$C_6$ alkyl,
$R^3$ is carboxy or esterified lower alkoxycarbonyl,
$Y_a$ is sulfur, and
A is $C_1$–$C_6$ alkylene,
and pharmaceutically acceptable salts thereof.

4. An aldose reductase inhibiting pharmaceutical composition which comprises, as an effective ingredient, at least one compound of the formula:



wherein
$R_a^1$ is halogen, nitro, amino, ($C_3$ to $C_8$)cycloalkyl, phenyl or phenoxy
$R^2$ is halogen or $C_1$–$C_6$ alkyl,
$R^3$ is carboxy or lower alkoxycarbonyl,
$Y_a$ is sulfur, and
A is $C_1$–$C_6$ alkylene,
or pharmaceutically acceptable salts thereof with a pharmaceutically acceptable carrier.

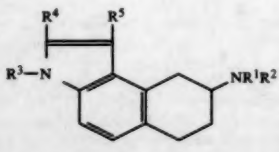
---

## 4,370,341
## 6,7,8,9-TETRAHYDRO-3H-BENZ[E]INDOL-8-AMINE DERIVATIVES

**Andre A. Asselin, St. Laurent, and Leslie G. Humber, Dollard Des Ormeaux, both of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada**

**Filed Dec. 11, 1980, Ser. No. 215,482**
**Int. Cl.³ A61K *31/40;* C07D *209/56***
**U.S. Cl. 424—274** **13 Claims**

1. A compound of the formula



(I)

in which $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ each is hydrogen or lower alkyl having 1 to 5 carbon atoms, or a therapeutically acceptable acid addition salt thereof.

6. A pharmaceutical composition for stimulating dopamine-receptors, which comprises a therapeutically effective amount of a compound of claim 1, or a therapeutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier therefor.

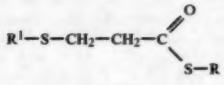
---

## 4,370,342
## S-ALKYL 3-ALKYLTHIOPROPIONOTHIOATE COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

**Haireddin Jacobi, Leichlingen, and Wolfgang Opitz, Overath, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG, Cologne, Fed. Rep. of Germany**

**Filed Mar. 6, 1981, Ser. No. 241,147**
**Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012000**
**Int. Cl.³ A61K *31/38, 31/44;* C07C *153/00;* C07D *333/24***
**U.S. Cl. 424—275** **17 Claims**

1. A compound which is an S-alkyl 3-alkylthiopropionothioates of the formula



(I)

in which
R and $R^1$ are identical or different and each represents a substituted straight-chain or branched alkyl radical, which is substituted by amino, alkylamino, dialkylamino, aryl, aryloxy, or hetero-aryl, the said aryl and hetero-aryl radicals in turn being optionally substituted by 1, 2 or 3 identical or different substituents selected from halogen, alkyl, alkoxy, trifluoromethyl, nitro, aralkoxy or aryloxy, or represent a cyclic alkyl radical.

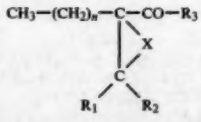
---

## 4,370,343
## METHOD FOR CONTROLLING HYPERTENSION

**Richard Mohrbacher, Maple Glen; Winston Ho, Hatfield, and Gene Tutwiler, Churchville, all of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.**

**Filed Sep. 21, 1981, Ser. No. 303,753**
**Int. Cl.³ A61K *31/335, 31/38***
**U.S. Cl. 424—275** **16 Claims**

1. A method which comprises administering to a hypertensive animal a therapeutically-effective antihypertensive amount of a compound selected from the group consisting of glycidic and thioglycidic acid compounds having the formula:



wherein n is an integer from 7 to 21; $R_3$ is a member selected from the group consisting of OH, O-loweralkyl, $NH_2$, NH-loweralkyl, and NH-loweralkyl-OH; X is a member selected from the group consisting of O and S; and each of $R_1$ and $R_2$ is a member selected from the group consisting of hydrogen and loweralkyl; or a therapeutically active basic salt of the foregoing acid.

## 4,370,344
## 5'-AMINOALKYL-4'-ALKYLPSORALENS

Kurt D. Kaufman, Kalamazoo, Mich. (by Marilee Kaufman, conservator), assignor to Elder Pharmaceuticals, Inc., Hamilton, Ind.

Continuation-in-part of Ser. No. 73,908, Sep. 10, 1979, Pat. No. 4,298,614. This application Feb. 23, 1981, Ser. No. 236,644
The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.
Int. Cl.³ C07D 493/04; A61K 31/34
U.S. Cl. 424—279 6 Claims

1. 5'-primaryaminoloweralkyl-4'-loweralkylpsoralen.

---

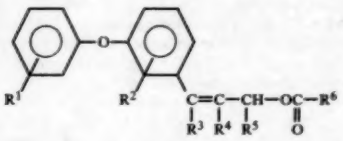
## 4,370,345
## PHENOXYPHENYLPROPENYLOXYCARBONYL COMPOUNDS AND THEIR USE AS INSECTICIDES AND ACARICIDES

Wolfgang Welter; Hilmar Mildenberger, both of Kelkheim; Werner Knauf; Anna Waltersdorfer, both of Frankfurt am Main, and Werner Bonin, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

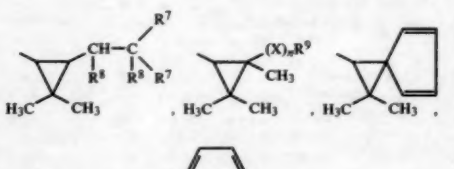
Filed Oct. 26, 1981, Ser. No. 315,150
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040488
Int. Cl.³ A01N 43/30, 53/00; C07C 69/743, 121/75
U.S. Cl. 424—282 14 Claims

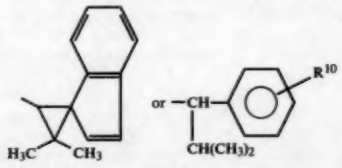
1. A compound of the formula

(I)



in which $R^1$ denotes hydrogen, halogen, $C_1$–$C_4$ alkyl or $C_1$–$C_4$ alkoxy, $R^2$ denotes hydrogen, halogen, $C_1$–$C_4$ alkyl or trifluoromethyl, $R^3$ denotes hydrogen, halogen, cyano or $C_1$–$C_4$ alkyl, $R^4$ denotes hydrogen, halogen, $C_1$–$C_4$ alkyl, phenyl or halogenophenyl, $R^5$ denotes hydrogen, $C_1$–$C_4$ alkyl, $C_2$–$C_3$ alkynyl or cyano, $R^6$ denotes a radical of the formula





$R^7$ denotes halogen, $C_1$–$C_4$ alkyl, phenyl or halogenophenyl, $R^8$ denotes halogen or the two $R^8$s together denote a further chemical bond, $R^9$ denotes $C_1$–$C_4$ alkyl, phenyl or halogenophenyl, $R^{10}$ denotes hydrogen, halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, $C_1$–$C_4$ alkylthio, halogeno-($C_1$–$C_4$) alkoxy, halogeno-($C_1$–$C_4$) alkylthio or methylenedioxy, X denotes oxygen or sulfur and n denotes 0 or 1.

2. A compound of the formula I in the form of its optical enantiomers and/or its stereoisomers.

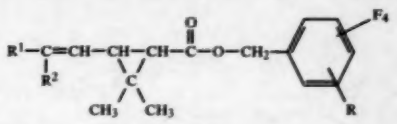
---

## 4,370,346
## HALOGENATED ESTERS

Nazim Punja, Crowthorne, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 211,943, Dec. 1, 1980. This application Dec. 9, 1981, Ser. No. 329,135
Claims priority, application United Kingdom, Dec. 21, 1979, 7944151; Nov. 20, 1980, 8037257; Dec. 17, 1980, 8040400
Int. Cl.³ C07C 69/743; A01N 53/00
U.S. Cl. 424—305 8 Claims

1. A compound of formula:



wherein $R^1$ and $R^2$ are both chloro or one of $R^1$ and $R^2$ is chloro or fluoro and the other is trifluoromethyl and R is in the 4-position with respect to the cyclopropane ester group and is selected from alkoxymethyl, alkylthiomethyl, phenoxymethyl, alkanesulphinylmethyl, alkanesulphonylmethyl, alkylaminomethyl and dialkylaminomethyl groups containing up to four carbon atoms in the alkyl or alkane moiety.

4. An insecticidal composition comprising an insecticidally effective amount of a compound according to claim 1 in association with an agriculturally acceptable diluent or carrier material.

---

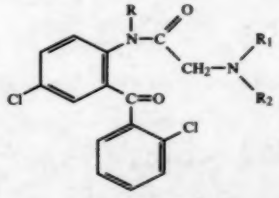
## 4,370,347
## METHOD OF TREATING ANXIETY WITH 2'-(ORTHOCHLOROBENZOYL)-4'-CHLORO-GLYCYLANILIDES, AND COMPOSITIONS THEREOF

Gilbert Mouzin; Henri Cousse, and Antoine Stenger, all of Castres, France, assignors to Pierre Fabre S.A., Paris, France

Division of Ser. No. 76,841, Sep. 19, 1979. This application Oct. 19, 1981, Ser. No. 312,529
Claims priority, application France, Sep. 25, 1978, 78 27401
Int. Cl.³ A61K 31/16
U.S. Cl. 424—324 6 Claims

1. A pharmaceutical composition, suitable for use in the treatment of anxious states, comprising a 2'-(orthochlorobenzoyl)-4'-chloroglycylanilide selected from compounds having the formula I:

(I)



in which:
R represents hydrogen or lower-alkyl;
$R_1$ and $R_2$ are lower-hydroxyalkyl,
and a pharmaceutically acceptable inorganic or organic acid addition salt thereof,
in an amount effective for said purpose, in association with a pharmaceutical carrier.

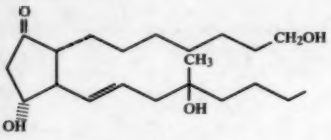
4,370,348

## METHOD OF INDUCING CYTOPROTECTION

David A. Shriver, Martinsville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 3, 1981, Ser. No. 270,165
Int. Cl.³ A61K *31/12*
U.S. Cl. 424—331 8 Claims

1. The method of inducing cytoprotection in mammals by increasing the natural integrity of the gastrointestinal mucosa which comprises administering to a mammal in need of such therapy a cytoprotective-effective amount of a prostaglandin derivative of the formula




in a pharmaceutically acceptable carrier.

---

4,370,349

## PROCESS FOR PREPARING FREEZE-DRIED LIPOSOME COMPOSITIONS

John R. Evans; Francis J. T. Fildes, and Jean E. Oliver, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 67,948, Aug. 20, 1979, Pat. No. 4,311,712, which is a continuation of Ser. No. 889,926, Mar. 24, 1978, abandoned. This application Sep. 18, 1981, Ser. No. 303,578
Claims priority, application United Kingdom, May 10, 1977, 19510/77
Int. Cl.³ A61K *47/00*
U.S. Cl. 424—365 9 Claims

1. A method for the manufacture of a freeze-dried, potential liposome, mixture which comprises preparing an aqueous liposome composition comprising at least one lipid-soluble or lipid-bound biologically active compound, and then freeze-drying the said composition to produce a freeze-dried, potential liposome, mixture.

---

4,370,350

## CHEWING GUM METHOD

E. Eugene Fisher, Chicago; R. Ray Estes, Downers Grove, both of Ill.; Orvin D. Lokken, and Elmer G. Paquette, both of Madision, Wis., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Apr. 28, 1980, Ser. No. 144,685
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 10 Claims

1. A method of making a chewing gum composition comprising the steps of:

reducing the viscosity of a chewing gum base to a value less than approximately 200,000 cps by heating to a temperature in the range of approximately 70° to 90° C.;

rapidly adding to said base a substantial portion of the total amount of an unheated bulking agent;

homogeneously mixing said bulking agent with said base while said bulking agent is added thereto;

cooling the mixture to a temperature in the range of 35° to 70° C. to increase the viscosity of the mixture and to form granules thereof; and

adding to the cooled mixture the balance of said bulking agent in order to form layers thereof around said granules.

4,370,351

## PROCESS FOR ENRICHING THE PROTEIN CONTENT OF FOOD AND FEEDSTUFF AND PRODUCTS THEREOF

James L. Harper, Rte. 2, Box 340-A, Ocilla, Ga. 31774

Continuation of Ser. No. 938,045, Aug. 30, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,487
Int. Cl.³ A23L *1/00*; C12N *1/14*; A01G *1/04*
U.S. Cl. 426—7 2 Claims

1. A process for increasing the protein content and improving the overall amino acid balance of a cereal grain which contains carbohydrates, without substantially altering the protein present in the cereal grain, by fixing nitrogen from a gaseous mixture containing molecular nitrogen comprising the steps of:

(a) forming a mixture of from about 40% to about 60% by weight cereal grain and from about 40% to about 60% by weight water;

(b) sterilizing said mixture in order to substantially eliminate the growth of substances which might compete with the growth of a spawn culture of the genus Pleurotus;

(c) inoculating said mixture with from about 1% to about 5% by weight of at least one member selected from the group consisting of *Pleurotus ostreatus, Pleurotus ulmarius, Pleurotus sapidus, Pleurotus cornucopiae,* and *Pleurotus florida;*

(d) maintaining the inoculated mixture in the presence of a mixture of a gaseous mixture of molecular nitrogen and oxygen at a temperature of from about 10° C. to about 46° C. for from about 21 to about 35 days so as to enable the mycelium of said spawn culture of the genus Pleurotus to reproduce; and

(e) recovering from the inoculated mixture as a food product the cereal grain with an increased protein content and improved amino acid balance without substantial alteration of the protein initially present.

---

4,370,352

## NON-FRIED INSTANT COOKING DRY NOODLES

Sanpei Murakami, Osaka; Sadao Kokeguchi, Ibaragi; Hiroshi Takahashi, Suita, and Ken Okada, Osaka, all of Japan, assignors to Kanebo Foods, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 197,211, Oct. 15, 1980, abandoned, and Ser. No. 1,352, Jan. 4, 1979, Pat. No. 4,243,680. This application Dec. 30, 1980, Ser. No. 221,514
The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.
Int. Cl.³ A23L *1/16*
U.S. Cl. 426—557 12 Claims

1. A non-fried, oil-free instant cooking dry noodle product capable of transformation into an edible cooked or boiled state within a short period of time when immersed in hot water and consisting of a starch-containing component comprised mainly of wheat or grain flour, said noodle product characterized by:

an average pore volume in the range of about 0.07 to about 0.40 ml/g;

the starch contained in the starch-containing component having an α-conversion degree of at least 85%, as measured by the diastase enzyme process;

a fine porous texture providing communication between the external surfaces of the noodles product with the internal portions thereof by a network of fine pores;

smooth, non-coated surfaces devoid of bubble-like formations;

devoid of portions of the dry noodle product sticking to adjacent portions;

storage stable for at least one year without substantial change in product quality; said noodle product yielding a non-sticking good sense, feel and taste when transformed into the edible coated state.

4,370,353

## ACID-RESISTING WHIPPING CREAM POWDER AND PROCESS FOR PRODUCING THE SAME

Naoki Yagi, Suita; Kwang Y. Kim, Higashi Osaka; Tarushige Nakaji, and Kazuuki Fujisaki, both of Yao, all of Japan, assignors to Minaminihon Rakuno Kyodo Kabushiki Kaisha, Miyazaki, Japan

Filed Oct. 8, 1980, Ser. No. 195,187
Claims priority, application Japan, Apr. 7, 1980, 55-45969
Int. Cl.³ A23L 1/19
U.S. Cl. 426—570 12 Claims

1. An acid-resisting whipping cream powder which comprises a caseinate selected from the group consisting of sodium caseinate and calcium caseinate; 10 to 70% by weight of a vehicle selected from the group consisting of lactose and dextrin, based on the total weight of the powder; 30 to 80% by weight of a member selected from the group consisting of milk fat, palm oil, coconut oil, soybean oil, cottonseed oil and a hardened oil thereof, based on the total weight of the powder; 5 to 20% by weight of an acetylated monoglyceride, based on the content of the said group member; and 0.5 to 10% by weight of a cyclic phosphate selected from the group consisting of sodium hexametaphosphate, sodium ultraphosphate and phytic acid based on the caseinate.

---

4,370,354

## STABILIZED FRUIT SUSPENSIONS AND METHOD FOR PREPARING THE SAME

Dianne P. Leipold, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 3, 1981, Ser. No. 327,150
Int. Cl.³ A23L 1/06; A23C 9/123, 9/13
U.S. Cl. 426—573 8 Claims

1. In a fruit suspension containing fruit, sugar, low methoxyl pectin and water, the improvement which comprises incorporating xanthan in an amount such that the xanthan to pectin ratio is from about 30:70 to about 70:30 based on the total weight of the xanthan and pectin added.

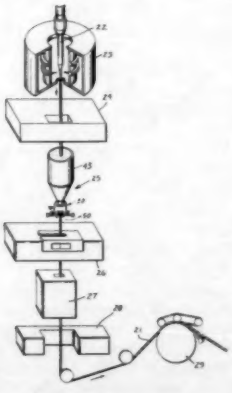
---

4,370,355

## METHODS OF AND APPARATUS FOR COATING LIGHTGUIDE FIBER

Paul J. Niesse, Atlanta, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,866
Int. Cl.³ B05D 1/26; G02B 5/14
U.S. Cl. 427—9 9 Claims



1. A method of coating lightguide fiber to provide a coated fiber having a predetermined diameter, said method including the steps of:

providing a supply of coating material;

providing a die having a passageway which communicates with the supply of the coating material, the die having an orifice which is disposed in a plane normal to the fiber and which is capable of being changed in cross-sectional size and configuration by the controlled application of forces about the periphery of the die;

moving a lightguide fiber along a path which extends through the passageway of the die to cause the fiber to be coated with a layer of the coating material;

measuring the diameter of the coated fiber; and

in response to the step of measuring the diameter of the coated fiber, regulating the orifice by applying substantially coplanar forces in a controlled manner about the periphery of the die to cause the coated fiber to have the predetermined diameter.

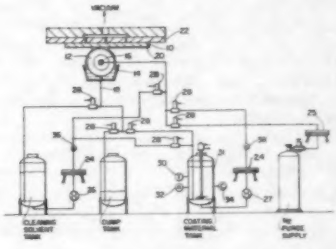
---

4,370,356

## METHOD OF MENISCUS COATING

Hendrik F. Bok, Fairhaven, Mass., and Philip J. Birbara, Windsor Locks, Conn., assignors to Integrated Technologies, Inc., Acushnet, Mass.

Filed May 20, 1981, Ser. No. 265,724
Int. Cl.³ B05D 3/06, 1/28
U.S. Cl. 427—38 15 Claims



1. Method of meniscus coating of an object comprising:

A. Flowing a coating material from the interior and through the wall of a stationary, permeable cylindrical surface, so as to develop downward laminar flow of coating material on the outside of the cylindrical surface;

B. Advancing an object to be coated in a plane tangentially to said laminar flow of coating material, such that a leading surface portion of the object intersects laminar flow of coating material at the apex of the cylindrical surface;

C. Supporting uniform meniscii of flowing coating material both at the leading edge and the trailing edge of coating material contacting said object; and

D. Uniformly disengaging the coated surface of the object from said lamainar flow of coating material.

9. Method of meniscus coating of an object as in claim 1, further including initially scrubbing and rinsing said object prior to said flowing of coating material.

10. Method of meniscus coating of an object as in claim 9, further including plasma cleaning of the object surface prior to said flowing of coating material.

---

4,370,357

## PROCESS OF CONTINUOUS METAL COATING

LeRoy O. Swartz, Bensalem, Pa., assignor to Cleveland Gear Company, Bensalem, Pa.

Filed Mar. 11, 1981, Ser. No. 242,621
Int. Cl.³ B05D 3/02
U.S. Cl. 427—46 3 Claims

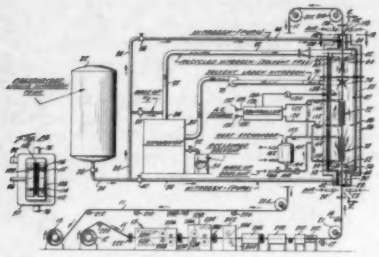
1. A method of recovering solvents evaporated during dry-

ing of solvent-borne coatings on continuously coated metal strip comprising:

(1) coating the strip;

(2) passing the strip continuously through a chamber having a nitrogen atmosphere;

(3) heating the strip above 450° Fahrenheit by electromagnetic induction means to drive off the solvent from the coating to create a solvent-laden nitrogen atmosphere;



(4) keeping the solvent-laden nitrogen atmosphere above 300° Fahrneheit by controlling the temperature of the strip;

(5) removing the solvent-laden nitrogen atmosphere from the chamber; and

(6) separating the solvent from the nitrogen.

---

**4,370,358**

## ULTRAVIOLET CURABLE SILICONE ADHESIVES

**Susan E. Hayes, Schenectady, and Richard P. Eckberg, Round Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Filed Sep. 22, 1980, Ser. No. 189,258**

**Int. Cl.³ C08F 2/50; C08G 77/40**

**U.S. Cl. 427—54.1** **14 Claims**

**1.** A solventless ultraviolet radiation curable composition for forming a pressure sensitive silicone adhesive comprised of:

(a) 100 parts by weight of an epoxy functional silicone polymer having the general formula:

wherein R is a monovalent hydrocarbon radical, and R′ is the same as R or a phenyl radical and R″ is an epoxy-containing aliphatic or cycloaliphatic radical; having, approximately, 0.01 to 0.05 mole % epoxy content and a viscosity of, approximately, 100 to 5000 centipoise at 25° C., $\chi$ is an integer representing 85 to 100 mole percent of the polymer units and y represents 0 to 15 mole percent diphenyl siloxy units;

(b) 90 to 280 parts by weight of a silicone MQ resin or mixture of such resins selected from:

(i) a first silicone resin comprised of mono-functional $R_3SiO_{0.5}$ units and tetra-functional $SiO_2$ units where R is as described above and the ratio of mono-functional units to tetra-functional units is, approximately, 0.5 to 2.0:1; or

(ii) a second silicone resin comprised of $R_aR_b''SiO_{0.5}$ units and $SiO_2$ units wherein R is as described above and R″ represents aliphatic or cycloaliphatic epoxide radicals; having, approximately, 0 to 0.005 mole % epoxy content, the sum of a band b is 3, and wherein the ratio of mono-functional to tetra-functional units is approximately 0.5 to 2.0:1, and

(c) an amount of ultraviolet light sensitive catalyst effective for initiating the cure of said silicone adhesive composition.

---

**4,370,359**

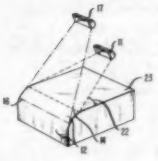
## FABRICATION TECHNIQUE FOR JUNCTION DEVICES

**Linus A. Fetter, Jackson; Richard E. Howard, Holmdel; Evelyn L. Hu, Somerset, and Lawrence D. Jackel, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 18, 1980, Ser. No. 178,900**

**Int. Cl.³ B05D 5/12**

**U.S. Cl. 427—63** **11 Claims**



**1.** A process for forming a junction device comprising the steps of depositing a first material layer, depositing an insulating material on a portion of said first material layer by impingement of a flux on said first material layer, and forming said junction device on an exposed portion of said first material layer characterized in that said junction device is formed on an edge of said first material layer by an edge aligning technique comprising the steps of positioning said first material layer relative to said flux such that the angle between said flux and said first material layer is smaller than the angle from the major surface of said first material layer to a line tangent to this layer at a point on the boundary line defining the extremity of the area where said insulating material is to be formed.

---

**4,370,360**

## FILM TYPE LIGHT RECEIVING ELEMENT AND SPUTTER METHOD OF MANUFACTURING THE SAME

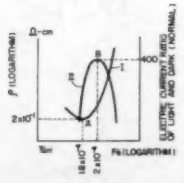
**Mario Fuse, and Mutsuo Takenouchi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Mar. 11, 1981, Ser. No. 242,735**

**Claims priority, application Japan, Mar. 14, 1980, 55-31517**

**Int. Cl.³ H01L 27/14**

**U.S. Cl. 427—76** **7 Claims**



**1.** A film type light receiving element comprising: an insulating substrate having a flat and smooth surface; metal electrodes and a photoconductive film provided in the form of layers on said flat and smooth surface; and an optically transmissive electrode film formed on said photoconductive film, a portion of said optically transmissive electrode film adjacent said photoconductive film having a high specific resistance and the remaining portion having a low specific resistance layer.

4,370,361

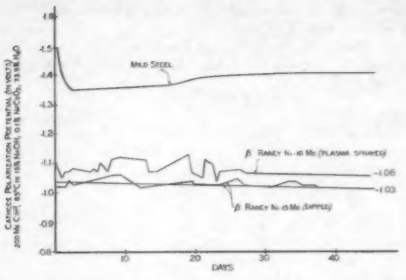
## PROCESS OF FORMING RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 25,153, Mar. 29, 1979, Pat. No. 4,240,895. This application Aug. 18, 1980, Ser. No. 179,150

Int. Cl.³ B05D 5/12; B01J 35/00

U.S. Cl. 427—123 7 Claims




1. A method of producing a low overvoltage electrode for use as a hydrogen evolution cathode in an electrolytic cell which comprises the steps of:

(a) coating with aluminum the surface of a clean non-porous conductive base metal substrate of a nickel-molybdenum alloy of a weight percent molybdenum within the range of from about 5 to about 20 and a weight percent nickel within the range of from about 95 to about 80;

(b) heat treating said coated surface by maintaining said surface at a temperature within the range of from about 700° to about 750° C. for a time from about 5 to about 15 minutes to diffuse a portion of said aluminum into outer portions of said structure to produce an integral nickel-molybdenum-aluminum alloy layer in said outer portions predominantly of Beta phase grains but insufficient to create a predominance of Gamma phase grains in said outer portions; and

(c) leaching out residual aluminum and intermetallics from the alloy layer until a porous Raney nickel-molybdenum layer is formed integral with said structure.

---

4,370,362

## METHOD OF MANUFACTURING TRANSFER PAPERS

Yoshi Matsui, 28-15 2-chome, Asakusabashi, Taito-ku Tokyo, Japan

Filed May 26, 1981, Ser. No. 267,332

Claims priority, application Japan, May 27, 1980, 55-70357

Int. Cl.³ B41M 5/00

U.S. Cl. 427—153 2 Claims

1. A method of making a transfer paper, which comprises forming a homogeneous mixture of cobalt thiocyanate, wax, a non-ionic surfactant, and another surfactant to form a wax ink, and melt coating the wax ink on to at least one surface of a base material.

---

4,370,363

## COATING COMPOUND FOR SILICA BRICKS

Peter Schulz, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H, Bochum, Fed. Rep. of Germany

Filed Aug. 14, 1981, Ser. No. 292,890

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032920

Int. Cl.³ B05D 3/02, 1/02, 7/22, 1/28

U.S. Cl. 427—230 8 Claims

1. A method for glazing the surfaces of silica bricks used in coke ovens, which comprises forming a suspension of water-glass powder and glass powder in a concentrated water-glass solution, applying the suspension in solution to the surfaces of silica bricks, drying said bricks, and then baking said bricks to form a protective layer which will prevent the penetration of liquid and gaseous substances into the brick.

---

4,370,364

## METHOD FOR LINING PIPE MAINS HAVING BRANCHING DOMESTIC CONNECTION PIPES

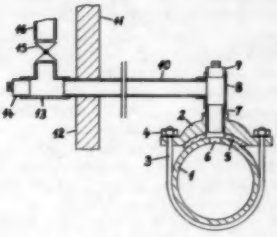
Hübert Boer, Reken, Fed. Rep. of Germany, assignor to diga - die gasheizung GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 333,222

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101409

Int. Cl.³ B05D 7/22, 3/12

U.S. Cl. 427—238 3 Claims




1. A method for lining main pipes, to which branching domestic connection pipes are connected, with an internal coating of a hardening plastic composition with which the main pipe is spread, comprising the steps of

introducing from a house interior an inflatable bladder with a connected pressure line into an opened domestic connection pipe into a region of its junction with the main pipe,

inflating the bladder through the connected pressure line and closing the domestic connection pipe tightly and in pressure-tight manner by means of the bladder in the region of said junction with the main pipe,

spreading the main pipe with plastic composition to form an internal coating therein, a composition plug, being determined in size by the position of the bladder, being forced into the junction of the domestic connection pipe,

then removing the pressure from the bladder and withdrawing the bladder with the pressure line again from the domestic connection pipe, and

before hardening of the plastic composition generating in the domestic connection pipe a sudden negative pressure from the house interior of such magnitude that the composition plug located in the junction is sucked into the domestic connection pipe and deformed into a lining in the domestic connection pipe in the region of said junction which lining uninterruptedly continues the internal coating of the main pipe.

---

4,370,365

## METHOD FOR IMPARTING WATER-REPELLENCY TO WOVEN FABRICS

Minoru Takamizawa; Akira Abe; Katsusuke Kasahara, all of Annaka; Yukito Komeno, Fukui, and Akira Aoyama, Takefu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo and Agehara Orimono Kogyo K.K., Fukui, both of, Japan

Filed Oct. 19, 1981, Ser. No. 312,828

Claims priority, application Japan, Oct. 21, 1980, 55-147334

Int. Cl.³ B05D 3/02

U.S. Cl. 427—387 15 Claims

1. A silicone-based water-repellent agent for imparting water-repellency to a woven fabric which comprises, as the silicone ingredient thereof:

from 10 to 90% by weight of a component (a) which is an

organohydrogenpolysiloxane containing, in a molecule, at least one organohydrogensiloxane unit represented by the general formula

$$R^1_aH_bSiO_{(4-a-b)/2},$$

in which

$R^1$ denotes a monovalent hydrocarbon group having from 1 to 30 carbon atoms,

a is a number of 0, 1, or 2 and

b is a number of 1 or 2 with the proviso that a+b is equal to 1, 2 or 3;

and

from 90 to 10% by weight of a component (b) which is selected from the group consisting of component (b-1), component (b-2) and combinations thereof, wherein component (b-1) is an alkenyl group-containing diorganopolysiloxane expressed by the average unit formula

$$R^2_cSiO_{(4-c)/2},$$

in which

$R^2$ denotes a monovalent hydrocarbon group, at least 5% by moles of the monovalent hydrogen groups denoted by $R^2$ being alkenyl groups, and

c is a positive number from 1.95 to 2.02 inclusive, and component (b-2) is a resinous organopolysiloxane composed of the monofunctional organosiloxane units represented by the general formula

$$R^3_3SiO_{0.5},$$

in which

$R^3$ denotes a monovalent hydrocarbon group having from 1 to 6 carbon atoms,

and the tetrafunctional siloxane units expressed by the formula $SiO_2$, the molar ratio of the monovalent organosiloxane units to the tetrafunctional siloxane units being in the range from 0.4:1 to 1.2:1.

---

**4,370,366**

## PROCESS FOR THE PRODUCTION OF AN ESTER MIXTURE, EMULSIONS CONTAINING THIS MIXTURE, AND THE APPLICATION THEREOF

**Hans Deiner, Neusäss, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Aug. 12, 1981, Ser. No. 292,078**

**Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031933**

**Int. Cl.³ B05D** *3/02;* **C07C** *67/02;* **C09F** *5/08*

**U.S. Cl. 427—389.9** **6 Claims**

1. Process for the production of a mixture of esters of chlorine substituted phenols, characterised in that

(a) 1 mol of 2,2'-dihydroxy-5,5'-dichloro-diphenyl methane with

(b) 1 to 2.5 mols of acetic anhydride and

(c) 0.8 to 2.2 mols of fatty acids with 6 to 20 C atoms are reacted together, with reflux, and the acetic acid formed and also any excess acetic anhydride are largely removed by distillation at elevated temperature.

---

**4,370,367**

## SELF-BONDING FLAME SPRAY WIRE FOR PRODUCING A READILY GRINDABLE COATING

**Edward R. Novinski, Mineola, and John H. Harrington, Warick, both of N.Y., assignors to Metco Inc., Westbury, N.Y.**

**Division of Ser. No. 936,169, Aug. 23, 1979, Pat. No. 4,276,353. This application Feb. 12, 1981, Ser. No. 233,804**

**Int. Cl.³ B32B** *15/16*

**U.S. Cl. 427—423** **9 Claims**

1. In the flame spray process, the improvement which comprises flame spraying a flame spray wire comprising a sheath of aluminum and a compacted powder core containing about 10 to 90% by weight of nickel, about 10 to 90% by weight of stainless steel, about 1 to 10% aluminum, and about 1/4 to 10% metal oxide, based on the total powder compacted core, said stainless steel and metal oxide content being in sufficient quantity and proportions that when sprayed will produce a readily grindable coating.

---

**4,370,368**

## PLASTIC BOTTLES AND PROCESS FOR PREPARATION THEREOF

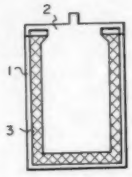
**Sadao Hirata, Yokohama; Isao Tanikawa, Ayase, and Yoshitsugu Maruhashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan**

**Filed Apr. 29, 1981, Ser. No. 258,772**

**Claims priority, application Japan, May 7, 1980, 55-59505; May 7, 1980, 55-59506**

**Int. Cl.³ B65D** *23/00*

**U.S. Cl. 428—35** **26 Claims**




1. A molded plastic bottle the walls of which are molded from a wall-forming component consisting essentially of a copolymer consisting essentially of 99 to 70% by weight of vinylidene chloride and 1 to 30% by weight of at least one acrylic or methacrylic monomer and further including up to 100 parts by weight of at least one member selected from other ethylenically unsaturated monomers per 100 parts by weight of the total amount of said two monomers, said copolymer having an oxygen permeability constant of less than $9\times10^{-14}$ cc-cm/cm$^2$-sec-cmHg as measured at a temperature of 20° C. and a relative humidity of 100% and a water vapor permeability constant of less than $3\times10^{-3}$ g-cm/m$^2$-day as determined according to the method of JIS Z-0208.

---

**4,370,369**

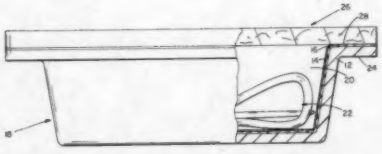
## HEAT-SEALABLE SHEET AND CONTAINER

**Laszlo J. Bonis, Swampscott, Mass., assignor to Composite Container Corporation, Medford, Mass.**

**Filed Jul. 2, 1981, Ser. No. 279,855**

**Int. Cl.³ B65D** *85/00;* **B32B** *1/02, 1/04, 27/08*

**U.S. Cl. 428—35** **20 Claims**




6. A thermoformed heat-sealable object for heat-sealable bonding at a bond region to a second object, said heat-sealable object comprising

a rigid structural layer of sufficient thickness and strength to provide bulk and rigidity to said first object,

a sticky heat-sealing layer on top of said structural layer, and

a nonsticky cover layer on top of said heat-sealing layer, said cover layer being sufficiently thin and being made of material with strength and melt characteristics appropriate to cause exposure and bonding of said heat-sealing

layer when heat-sealing temperature and pressure are applied to said bond region, and to cause the first object to have nonsticky surfaces before heat-sealing and after heat-sealing at regions other than said bond region.

7. The object of claim 6 in which said heat-sealable object is a container and said bond region is an annular flange surrounding a depressed portion, and said second object is a cover for sealing to said flange.

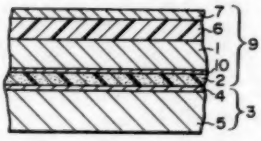
---

4,370,370

## THERMOSENSITIVE RECORDING ADHESIVE LABEL

Susumu Iwata, Shizuoka, and Keiichi Maruta, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,694
Int. Cl.³ B41M 5/18
U.S. Cl. 428—40 16 Claims




1. A thermosensitive recording adhesive label comprising:

a support sheet;

a thermosensitive coloring layer formed on the front side of said support sheet, said thermosensitive coloring layer comprising a colorless or light-colored leuco dye and an acidic material capable of coloring said leuco dye when heat is applied thereto;

a front barrier layer formed on said thermosensitive coloring layer, said front barrier layer comprising a water-soluble polymeric material capable of preventing intrusion of materials which may discolor said thermosensitive coloring layer;

a back barrier layer formed on the back side of said support sheet, said back barrier layer comprising a water-soluble polymeric material capable of preventing intrusion of materials which may discolor said thermosensitive coloring layer;

an adhesive layer formed on said back barrier layer; and

a disposable backing sheet which is attached to said adhesive layer and can be peeled off said adhesive layer when said thermosensitive recording adhesive label is used.

---

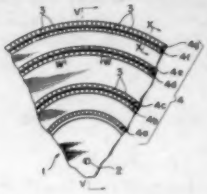
4,370,371

## RUBBER DISC FOR A RECORD PLAYER TURNTABLE

Akitaro Nakahira, Takarazuka, Japan, assignor to Hohyu Rubber Co., Ltd., Osaka, Japan

PCT No. PCT/JP80/00282, § 371 Date Jul. 16, 1981, § 102(e) Date Jul. 16, 1981, PCT Pub. No. WO81/01481, PCT Pub. Date May 28, 1981
PCT Filed Nov. 18, 1980, Ser. No. 285,102
Claims priority, application Japan, Nov. 20, 1979, 54-151123; Feb. 1, 1980, 55-11619; Oct. 13, 1980, 55-143417; Oct. 13, 1980, 55-143418; Oct. 15, 1980, 55-144998
Int. Cl.³ B32B 3/02; G11B 3/62
U.S. Cl. 428—65 25 Claims

1. A rubber disc for a record player turntable which is a sheet-like cured molding of a rubber composition, said cured molding having a hardness within the range from 30° as measured with an A-type rubber hardness tester to 15° as measured with an F-type rubber hardness tester and an impact resilience of not less than 40%.



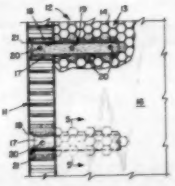
---

4,370,372

## METHOD OF JOINING HONEYCOMB PANELS USING A FASTENER ELEMENT

William E. Higgins, Largo, and Richard C. Lazzara, St. Petersburg, both of Fla., assignors to Advanced Technology & Research, Inc., Largo, Fla.

Filed Mar. 30, 1981, Ser. No. 248,894
Int. Cl.³ B32B 3/12, 7/08
U.S. Cl. 428—116 9 Claims



4. Coupling means for securing together two abutting honeycomb panels each having internal cellular structure positioned between cover sheet members, comprising means providing aligned bores in the respective panels, at least one of said bores being a through bore extending entirely through its panel, including the respective cover sheet members, each bore being surrounded by regions where cell walls are ruptured to provide spaces of irregular size and location during formation of said bores, an open-ended hollow tubular fastener inserted through said bores to bridge said aligned bores, said fastener having side wall apertures that communicate with said regions in both panels and a solid column of anchoring material located within the hollow portion of said fastener, said column having branches extending through said apertures to occupy said regions.

---

4,370,373

## FLEXIBLE EDGING OF DESKS

Thomas H. Janicz, Haverford, Pa., assignor to Burlington Industries, Inc., Greensboro, N.C.

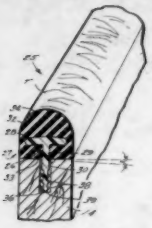
Filed Jul. 17, 1980, Ser. No. 169,742
Int. Cl.³ B32B 3/02, 5/18
U.S. Cl. 428—151 13 Claims

1. A structure providing a protective edge of a piece of furniture and distinct from structural components of the piece of furniture, said structure consisting essentially of:

a core consisting essentially of an elongated member of relatively hard, rigid material having an elongated cross-member disposed in a plane, and an elongated leg disposed in a plane substantially perpendicular to the plane of said cross-member and integral therewith along substantially the entire length thereof; and

an elongated body of relatively soft, flexible material, formed around the core cross-member so that the cross-

member is substantially completely encompassed by the flexible, relatively soft material, with at least a portion of the leg extending outwardly from the body and attached to structural components of the piece of furniture;



said elongated core and body being substantially coextensive along their entire length.

---

4,370,374

## MULTILAYER PLASTIC FILM, PROCESS FOR ITS PRODUCTION AND ITS USE

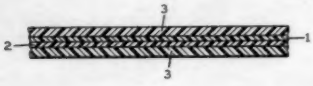
Fritz Raabe, and Robert Schruhl, both of Bonn, Fed. Rep. of Germany, assignors to Plate Bonn Gesellschaft mit beschrankter Haftung, Bonn, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,042

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935631

Int. Cl.³ B32B *27/08, 27/40, 31/00*

U.S. Cl. 428—216 17 Claims



1. Multilayer plastic film useful for encapsulating objects, which comprises

(a) a first individual film having a thickness of from 10 to 50 microns and a softening point of from 140° to 250° C., and

(b) a second film having a thickness of from 10 to 50 microns, a softening point of from 70° to 130° C. and an initial melting point of from 100° to 190° C., there being a temperature difference of from 10° to 60° C. between the softening point and the initial melting point of the second film.

---

4,370,375

## ABRASION-RESISTANT MONOFILAMENT WITH MOLYBDENUM DISULFIDE USEFUL IN THE FORMATION OF PAPERMAKING BELTS

William B. Bond, Marietta, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1981, Ser. No. 255,743

Int. Cl.³ D03D *15/10;* D21F *7/08*

U.S. Cl. 428—229 8 Claims

1. A polyamide monofilament characterized by improved transverse abrasion resistance, oriented about from 3.4 to 6.0 times the original length, having a diameter of about from 5 to 30 mils and comprising filament-forming polyamide and about from 3 to 10 weight percent, based on the total weight of the monofilament, of molybdenum disulfide.

7. In a woven, heat set, papermaking belt of machine and transverse direction thermoplastic filaments, the improvement wherein at least about 25% of the filaments in the transverse direction are monofilaments having a diameter of about from 5 to 30 and comprising filament forming polyamide and about from 3 to 10 weight percent, based on the total weight of the filament, of molybdenum disulfide.

---

4,370,376

## TETRAFLUOROETHYLENE POLYMER DISPERSIONS

Subhash V. Gangal, and Allan H. Olson, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 141,688, Apr. 18, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,825

Claims priority, application United Kingdom, Apr. 10, 1981, 8111396

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—241 7 Claims

1. A coating dispersion which imparts resistance to attack by acidic flue gas to glass fabric coated with said dispersion, consisting essentially of

(a) water,

(b) 5–65% by weight tetrafluoroethylene polymer, said weight based on weight of water and polymer, said polymer being of film-forming molecular weight,

(c) 2–60% by weight of a polyhydrolyzable silane of the formula

$$R_1Si(OR)_3$$

wherein R is lower alkyl, preferably alkyl of 1–3 carbon atoms, and $R_1$ is phenyl or substituted lower alkyl, preferably of 1–3 carbon atoms, in which the substituents are selected from halogen, quaternary ammonium, or —NR′R″ in which R′ and R″ are each H, lower alkyl, lower alkoxyalkyl, amino lower alkyl, hydroxyl lower alkyl, or substituted amino lower alkyl, said weight based on weight of tetrafluoroethylene polymer,

(d) 1–20% by weight of a hydrocarbyl siloxane, said weight based on weight of tetrafluoroethylene polymer,

(e) 1–20% by weight of a polymer of a fluorinated ester of an acrylic acid, said weight based on weight of tetrafluoroethylene polymer.

2. The coating dispersion of claim 1 wherein the tetrafluoroethylene polymer is polytetrafluoroethylene.

3. The coating dispersion of claim 2 wherein the silane has the formula $R_1Si(OR)_3$ wherein R is $—CH_3$ or $—C_2H_5$ and $R_1$ is substituted lower alkyl in which the substituent is in the γ position and is an amino- or amino-substituted group.

4. The coating dispersion of claim 3 wherein the silane is γ-aminopropyl triethoxy silane.

5. The coating dispersion of claim 3 wherein the silane is γ-aminopropyl trimethoxy silane.

---

4,370,377

## METALLIZED LABELS FOR CONTAINERS

Johannes T. Brugmans, Enkhuizen, Netherlands, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Dec. 5, 1980, Ser. No. 213,682

Claims priority, application Netherlands, Jul. 1, 1980, 8003810

Int. Cl.³ B32B *5/16, 27/00;* C09J *7/02*

U.S. Cl. 428—327 4 Claims

1. A metallized label for containers including bottles which comprises a coating of lacquer, containing 2 to 10% by weight of an additive, wherein said percentage is calculated on the amount of resin in the lacquer and wherein said additive is soluble in an aqueous caustic soda solution containing 1.5% by weight of caustic soda, heated at 80° C.; a stratum of metal deposited upon the lacquer coating, wherein said lacquer does not attack the metal stratum of said label; a laminating adhesive; a stratum of paper and an adhesive.

4,370,378

## LOW DENSITY, EXTRUDED ETHYLENIC POLYMER FOAMS

Vincent S. Zabrocki, Newark, and Marlin G. Bussey, Thornville, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 158,856, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,681, Mar. 15, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,567

Int. Cl.³ B32B 7/00; C08F 110/02

U.S. Cl. 428—339 5 Claims

1. As an article of manufacture, an ethylenic polymer resin extruded foam plank having a density of from about 0.8 to 1.6 pounds per cubic foot, dimensional stability, substantially closed-cell structure, a cross-sectional area of at least 6 square inches, and a minimal cross-sectional dimension of at least 0.5 inch, wherein said ethylenic polymer resin consists essentially of non-crosslinked low density polyethylene and wherein said foam plank contains less than about 20 percent of open cells therein.

---

4,370,379

## METHOD FOR PREPARING ORIGINAL FOR PROJECTION AND TRANSFER FILM FOR ELECTROSTATIC PHOTOGRAPHY FOR USE IN CARRYING OUT SAID METHOD

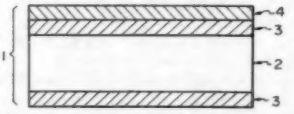
Mamoru Kato, Hirakata; Shoji Matsumoto, Neyagawa, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Division of Ser. No. 139,480, Apr. 11, 1980, Pat. No. 4,320,186. This application Jul. 16, 1981, Ser. No. 284,069

Claims priority, application Japan, Apr. 13, 1979, 54/44263

Int. Cl.³ B32B 27/06, 27/36; G03G 13/16

U.S. Cl. 428—341 7 Claims




1. A transfer film capable of production of a transparent original for projection of images, said transfer film comprising a heat-resistant transparent plastic film substrate, a toner receiving layer constituting a binder resin in an amount of at least $1.0\times10^{10}$ to $1.0\times10^{13}$ Ω, and an undercoating layer interposed between said substrate and said toner receiving layer, said undercoating layer comprising an electrically conductive resin in an amount of at least 25% by weight of the undercoat, said undercoating layer being applied in an amount of at least 1.0 g/m² and having a surface resistance of $1.0\times10^{6}$ to $9.0\times10^{9}$ Ω.

---

4,370,380

## PRESSURE-SENSITIVE ADHESIVE

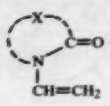
Kishore R. Shah, Chelmsford, Mass., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 137,297, Apr. 4, 1980, Pat. No. 4,337,325, which is a continuation-in-part of Ser. No. 201,349, Oct. 27, 1980, Pat. No. 4,300,820. This application Apr. 12, 1982, Ser. No. 367,256

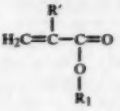
Int. Cl.³ C09J 7/02; C08L 35/00, 39/06

U.S. Cl. 428—355 8 Claims

1. An adhesive sheet material comprising a flexible backing and supported thereon a pressure-sensitive adhesive layer comprising a composition consisting essentially of an optically clear blend of (1) a water-soluble polymer of a vinyl lactam having the structure




in which X represents an alkylene bridge having three to five carbon atoms, or a copolymer thereof with 1 to 80 mole percent of copolymerizable monomer containing a polymerizable ethylenic unsaturation, and (2) a tacky water-insoluble copolymer comprising (A) an ester or a mixture of esters having the structure




in which R' represents hydrogen or methyl and $R_1$ represents alkyl having from 1 to 14 carbon atoms and (B) from 1 to 12% by weight, based on the tacky copolymer of an ethylenic monomer containing an acid group, said vinyl lactam polymer or copolymer being present in an amount from 1 to 30% by weight of the blend and having a glass transition temperature from 20° to 150° C., and the tacky copolymer having a glass transition temperature below 0° C. and being present in an amount from 70 to 99% by weight of the blend and being substantially free from cross-linking and having a viscosity less than 50,000 cp at 350° F. so that it possesses by itself insufficient cohesive strength to be useful as a pressure-sensitive adhesive, said blend having a viscosity less than 100,000 cps at 350° F.

---

4,370,381

## GRANULOCYTE-SEPARATING MATERIAL AND GRANULOCYTE SEPARATOR

Katsunori Horikoshi, and Tsutomu Abe, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 2, 1981, Ser. No. 239,259

Claims priority, application Japan, Mar. 12, 1980, 55-30247; Mar. 12, 1980, 55-30248

Int. Cl.³ B32B 9/00; B01D 15/00, 39/08; D02G 3/00

U.S. Cl. 428—392 9 Claims

1. A granulocyte-separating material comprising a carrier in the form of a film, granule, powder or fiber having coated thereon a fatty acid derivative containing a fatty acid moiety having 10 to 22 carbon atoms.

---

4,370,382

## MODIFIED ZINC-RICH COATINGS

George A. Salensky, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 19, 1980, Ser. No. 160,940

Int. Cl.³ B32B 15/08

U.S. Cl. 428—418 10 Claims

1. Corrosion resistant article comprising a metallic substrate and adhering thereto as a coating a composition comprising:

(A) a thermoplastic polyhydroxyether reaction product of substantially equimolar amounts of a polynuclear dihydric phenol and epichlorohydrin, said thermoplastic polyhydroxyether having a degree of polymerization of at least about 80;

(B) about 300 to about 1100 parts by weight, per 100 parts of polyhydroxyether, of zinc pigment;

(C) about 80 to about 300 parts by weight, per 100 parts of polyhydroxyether, of zinc phosphosilicate;

(D) 0 to about 35 parts by weight, per 100 parts of polyhy-

droxyether, of a heat hardened resole phenol-aldehyde condensation resin; and

(E) 0 to about 15 parts by weight, per 100 parts of polyhydroxyether, of a suspending agent.

---

4,370,383

## MAGNETIC RECORDING MEDIUM

Hiroshi Kawahara, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1980, Ser. No. 207,899
Claims priority, application Japan, Jan. 22, 1980, 55-5271
Int. Cl.[3] G11B *5/70*
U.S. Cl. 428—425.9 6 Claims

1. In a magnetic recording medium which comprises a substrate coated with a magnetic layer comprising a magnetic powder and a binder, the improvement characterized in that said binder comprises, as a rubber component, a urethane resin comprising the reaction product of a $C_4$–$C_8$ alkylenediisocyanate as an isocyanate component and a $C_3$–$C_{12}$ alkyleneglycol as a polyol component.

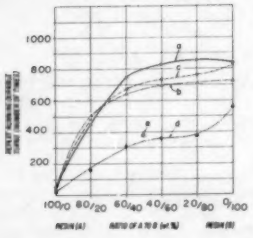
---

4,370,384

## MAGNETIC RECORDING MEDIUM

Akihiko Hosaka; Yukihiro Isobe, and Kiyotaka Okuyama, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,665
Claims priority, application Japan, Oct. 3, 1980, 55-137812
Int. Cl.[3] G11B *5/68*
U.S. Cl. 428—425.9 3 Claims




1. In a magnetic recording medium having a substrate coated with a magnetic layer comprising a magnetic powder and a binder, the improvement characterized in that said binder in said magnetic layer consists essentially of 20 to 70 wt.% of a polyester resin, 80 to 30 wt.% of a vinyl chloride-vinylidene chloride copolymer and a polyisocyanate.

---

4,370,385

## MASKING OF ABRASION INJURY ON GLASS ARTICLES

Akiteru Yoshida; Akiro Yokoo; Shuichi Yokokura, all of Takasaki; Minoru Takamizawa, Tokyo; Yoshio Inoue, and Hiroshi Yoshioka, both of Annaka, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 83,126, Oct. 9, 1979, abandoned. This application Sep. 3, 1981, Ser. No. 299,249
Claims priority, application Japan, Jul. 18, 1979, 54/90330
Int. Cl.[3] B32B *17/10*
U.S. Cl. 428—429 9 Claims

1. A scuff-masking composition for glass articles which comprises, in solution if solvent is present:

*Component A* which is an organopolysiloxane represented by the average compositional formula

$$(C_6H_5)_x(CH_3)_y(OR)_zSiO_{\frac{4-(x+y+z)}{2}}$$

wherein R is an alkyl group having 1 to 4 carbon atoms, and x, y and z are the numbers having the relationship

$$1 \leqq x+y<2$$

$$1<y/x<10$$

$$0.4 \leqq z<2;$$

*Component B* which is a curing catalyst for component A; and

*Component C* which is a surfactant, the quantity of the surfactant being in amounts sufficient to improve removability of the cured product by aqueous alkali said composition being curable at up to about 50° C.

2. The composition as set forth in claim 1, in which the composition is in the form of an alcohol solution.

5. The glass article which has a coat film on at least a part of its surface thereby masking scuffs on the surface, the film being a cured product of the composition claimed in claim 1 or 2.

---

4,370,386

## REINFORCED UNSATURATED POLYESTER RESIN LAMINATE

Masakazu Uekita, Kobe; Yasuo Fushiki, Takatsuki, and Masaharu Abe, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 15, 1980, Ser. No. 189,860
Claims priority, application Japan, Sep. 19, 1979, 54-121180
Int. Cl.[3] B32B *15/08, 15/12, 27/04, 27/42*
U.S. Cl. 428—458 7 Claims

1. An electrical laminate having a cladding metal foil adhesively bonded to at least one side thereof, said laminate comprising a plurality of fibrous cellulosic sheet layers each impregnated with and joined together by a cured unsaturated polyester resin, said cellulosic sheets each having a deposit thereon in direct contact with its cellulosic fiber surface of a mixture or condensate essentially consisting of an aminoplast and a fatty derivative having at least one functional group capable of condensation with the methylol group of said aminoplast, the pick up amount of said deposit being 3 to 30% by weight of said paper sheet on dry basis.

---

4,370,387

## PRE-COATED STEEL SHEETS AND PROCESS FOR PRODUCTION THEREOF

Nagaharu Ueno; Joji Oka; Hidejiro Asano, all of Tokyo; Takahisa Ogasawara, Tokai; Kiyokazu Mizutani, Inagawa, and Yoshiitsu Tominaga, Tokyo, all of Japan, assignors to Toagosei Chemical Industry Co., Ltd. and Nippon Steel Corporation, both of Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,307
Claims priority, application Japan, Mar. 19, 1980, 55-33891
Int. Cl.[3] B32B *9/06*
U.S. Cl. 428—458 18 Claims

10. A pre-coated steel sheet produced by coating a resin composition comprising mainly an acryloyloxy- or methacryloyloxy-terminated polyester on the surface of a steel sheet, said acryloxy- or methacryloyloxy-terminated polyester being prepared by reacting a hydroxy-terminated polyester comprising (a) a dicarboxylic acid unit containing about 10 to about 80 mol% of a terephthalic acid unit and (b) a dihydric alcohol unit containing about 30 mol% or more of a dihydric alcohol unit containing 3 or more carbon atoms, and having a number average molecular weight of about 400 to about 5,000, with acrylic acid or methacrylic acid, and curing the thus-coated resin composition by irradiating the sheet with an electron beam.

4,370,388

## LAMINATED MULTILAYER STRUCTURE

Masaharu Mito, and Masahiro Koya, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Mar. 11, 1980, Ser. No. 129,192
Claims priority, application Japan, Mar. 14, 1979, 54-28784
Int. Cl.³ B32B 15/08
U.S. Cl. 428—461 8 Claims

1. A laminated multilayer structure composed of a grafted high-density polyethylene resin layer directly attached to a layer of a resin selected from the group consisting of polyamide resins, polyester resins, saponified copolymers of ethylene and vinyl acetate, or to a metal layer; characterized in that said grafted high-density polyethylene resin layer is composed of

(a) 97 to 50 parts by weight, per 100 parts by weight of the resins (a) and (b) combined, of a high-density polyethylene resin having a density of 0.945 to 0.970 g/cm³ and being grafted with an aliphatic dicarboxylic acid or its functional derivative, said resin being optionally mixed with a high-density polyethylene resin having a density of 0.945 to 0.970 g/cm³,

(b) 3 to 50 parts by weight, per 100 parts by weight of the resins (a) and (b) combined, of an ethylene/4-methyl-1-pentene copolymer having an ethylene content of 93 to 99.5 mole% and a melt index at 190° C. of 0.1 to 10 g/10 min., and

(c) 0 to 20 parts by weight, per 100 parts by weight of the resins (a) and (b) combined, of one member of the group consisting of a rubbery synthetic polymer and copolymer.

---

4,370,389

## COATED PAPER OF IMPROVED PRINTABILITY

Toshimasa Ogura, Tokyo, and Yasunosuke Sakai, Funabashi, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 252,803
Claims priority, application Japan, Apr. 16, 1980, 55-50128
Int. Cl.³ B32B 27/08
U.S. Cl. 428—511 13 Claims

1. A coated paper comprising a base paper and, provided thereon, a coating layer containing a latex and a paper-coating pigment, which is characterized in that said latex is a latex of a styrene-butadiene block copolymer wherein the proportions of styrene and butadiene are 60–92% by weight and 8 to 40% by weight, respectively, or modified styrene-butadiene copolymer wherein the copolymer is a copolymer of styrene, butadiene, and an acrylic or methacrylic ester wherein the proportions contained in the modified styrene-butadiene copolymer are 55 to 85% by weight, 10–40% by weight, and 5 to 35% by weight, respectively, the styrene block of which is composed of 8 to 40 monomeric units.

---

4,370,390

## 3-D CHOPPED-FIBER COMPOSITES

Robert C. Burk, Chesterfield, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 15, 1981, Ser. No. 273,487
Int. Cl.³ B32B 9/00, 27/14, 15/04
U.S. Cl. 428—614 17 Claims

1. A material formed by molding, having a composite structure comprising:

a matrix material; and

a plurality of discrete reinforcing fiber elements randomly oriented, overlapping and interlocking with respect to each other and contained in and bonded to said matrix material, said fiber elements further comprising:

at least three uni-directional fibers, each having a longitudinal axis, joined together before adding said matrix material, so that each of said fibers is oriented in fixed, skewed and overlapping relationship with the remaining of said at least three fibers and at least one of said at least three fibers

lies in a plane other than the plane of said axes of the remainder of said at least three fibers.

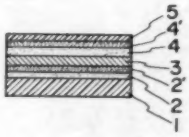
---

4,370,391

## RECORDING MATERIAL

Koichi Mori, and Masafumi Nakao, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1981, Ser. No. 245,061
Claims priority, application Japan, Mar. 18, 1980, 55-34238
Int. Cl.³ B32B 15/04; G01D 15/10, 15/34
U.S. Cl. 428—697 11 Claims




1. A recording material, comprising: a substrate; and superimposed on top of the substrate in the following order, a first stabilizing layer; a low toxicity metallic recording layer; and a second stabilizing layer; said first stabilizing layer being composed of an auxiliary metal oxide layer as an upper layer and an inorganic compound layer formed of an inorganic compound selected from the group consisting of a metal oxide, a metal nitride and a metal fluoride as a lower layer for converting said auxiliary metal oxide layer to a surface-flat glassy material, wherein when said inorganic compound layer is a metal oxide, the metal oxide of the auxiliary metal oxide layer is different from the metal oxide of the inorganic compound layer.

7. A recording material according to claim 1, wherein said metallic recording layer is a combination of two metals which produce a eutectic.

---

4,370,392

## CHROME-HALOGEN ENERGY STORAGE DEVICE AND SYSTEM

Robert F. Savinell, Akron, and Chung-Chiun Liu, Cleveland, both of Ohio, assignors to The University of Akron, Akron, Ohio

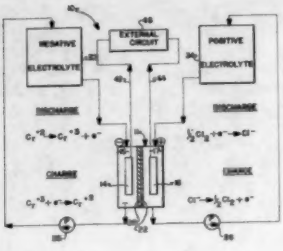
Filed Jun. 8, 1981, Ser. No. 271,578
Int. Cl.³ H01M 8/04
U.S. Cl. 429—15 24 Claims

1. A metal-halogen energy storage device, comprising:

an electro-chemical cell, said cell having an anion permeable membrane,

a positive electrode and a negative electrode located in said cell, said anion permeable membrane separating said positive electrode and said negative electrode and forming a chamber for each said electrode,

a negative fluid, said negative fluid located in said negative electrode chamber, said negative fluid having ions therein selected from the group consisting of tin, titanium, vanadium and chromium;




a positive fluid, said positive fluid located in said positive electrode chamber, said positive fluid having a halogen gas and halogen ions therein.

---

**4,370,393**

## SOLID ELECTROLYTES

**Tetsuo Watanabe, Nagoya; Syunzo Mase, Tobishima, and Shigeo Soejima, Nagoya, all of Japan, assignors to NGK Insulators Ltd., Nagoya, Japan**

**Filed Sep. 8, 1980, Ser. No. 184,979**
**Claims priority, application Japan, Sep. 18, 1979, 54/118716**
**Int. Cl.³ C04B *35/48*; H01M *6/18***
**U.S. Cl. 429—193** **1 Claim**

1. A solid electrolyte of $ZrO_2$ ceramics consisting essentially of cubic crystals, monoclinic crystals and tetragonal crystals owing to addition of $Y_2O_3$, having an average grain size of monoclinic crystals and tetragonal crystals of not greater than 2 μm, a ratio of the intensity of the monoclinic $(11\bar{1})$ X-ray diffraction line to that of the cubic (200) line being 0.01–2.5 and a ratio of the intensity of the tetragonal (200) X-ray diffraction line to that of the cubic (200) line being not greater than 1.0, wherein monoclinic crystal grains and tetragonal crystal grains are present between cubic crystal grains.

---

**4,370,394**

## SALT COMPOSITION USABLE AS A FUSED ELECTROLYTE IN ACCUMULATORS

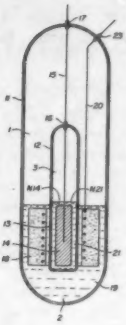
**Frederic Breda, Pas-de-Calais; Pierre Jonville, Clermont-Ferrand, both of France; Angelo Bonomi, Onex, and Jack Ambert, Grand-Lancy, both of Switzerland, assignors to Proge Groupement d'Interet Economique, Paris, France**

**Division of Ser. No. 143,289, Apr. 24, 1980, Pat. No. 4,287,270.**
**This application Jun. 8, 1981, Ser. No. 271,120**
**Claims priority, application France, Apr. 26, 1979, 79 11226**
**Int. Cl.³ H01M *6/04***
**U.S. Cl. 429—199** **2 Claims**

1. A process for preparing a hydroxide-free alkali salt composition for use as a molten anode electrolyte in a secondary cell having an alkali metal anode and an alkali alumina separator, which method comprises:

preparing a mixture of alkali metal amide, alkali metal hydride, and alkali metal halide;

and adding aluminium to the mixture;



whereby the aluminium reacts with the alkali metal amide to form aluminium amide and alkali metal.

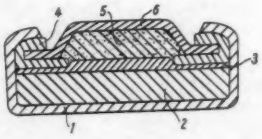
---

**4,370,395**

## ALKALINE CELL

**Toru Nagaura, Koriyama, and Takayuki Aita, Fukushima, both of Japan, assignors to Union Carbide Corporation, Danbury, Conn.**

**Filed Jun. 3, 1981, Ser. No. 270,100**
**Claims priority, application Japan, Jun. 4, 1980, 55-75286**
**Int. Cl.³ H01M *4/32, 4/34***
**U.S. Cl. 429—219** **3 Claims**




1. An alkaline cell comprising a cathode material, an alkaline electrolyte and an anode material and wherein the cathode material comprises an Ni- and Ag-containing oxide having trivalent nickel ion and monovalent silver ion present in a substantially equimolar ratio.

---

**4,370,396**

## PROCESS FOR PRODUCING COLOR FILTER PLATES

**Masamichi Sato; Kenji Matsumoto, both of Asaka, and Shunichi Naito, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Fuji Photo Optical Co., Ltd., Saitama, both of, Japan**

**Filed Feb. 17, 1981, Ser. No. 235,228**
**Claims priority, application Japan, Feb. 15, 1980, 55/18091**
**Int. Cl.³ G03C *7/00***
**U.S. Cl. 430—7** **6 Claims**

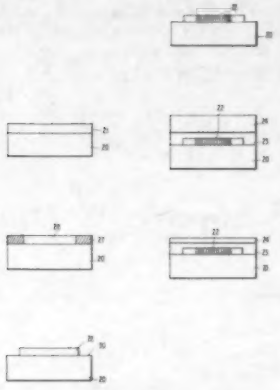
1. A process for producing a color filter plate which comprises

forming a color filter pattern on a silver halide emulsion layer of a photographic material comprising a transparent support with emulsion layer thereon, while the emulsion layer of areas to be removed is subjected to imagewise exposure, development and an etch-bleaching treatment to remove the emulsion layer of said areas,

adhering a transparent plate to said emulsion layer, and

abrading thereafter either the transparent support or the transparent plate to a desired thickness,

wherein said formation of a color filter pattern on a silver halide emulsion is performed by a process which comprises carrying out a pattern exposure for the first color of a black-white silver halide emulsion layer in a photographic material comprising a support and at least one black-white silver halide emulsion layer provided on the support, forming a pattern containing a dye of the first



color by color development with a developer containing a color coupler, carrying out a pattern exposure for the second color of the unexposed part containing silver halide, forming a pattern containing a dye of the second color by color developement with a developer containing a color coupler, and optionally repeating the same steps forming a pattern containing a dye of subsequent colors, to form an image composed of at least two colors, and removing silver after the final color development.

---

**4,370,397**

## PRESENSITIZED PLASTIC CARD, TAMPERPROOF IDENTIFICATION CARD PREPARED THEREFROM, AND PROCESS FOR MANUFACTURE OF TAMPERPROOF IDENTIFICATION CARD

**Claude Ceintrey, Neuville les Dieppe, and Monique Detain, Aubermesnil Beaumais, both of France, assignors to Rhone-Poulenc Systemes, Creteil, France**

**Filed Apr. 22, 1980, Ser. No. 142,764**

**Claims priority, application France, Apr. 24, 1979, 79 10375**

**Int. Cl.³ G03C *3/00*; G09F *3/02***

**U.S. Cl. 430—10** **20 Claims**

1. A tamperproof identification card bearing information which may be in the form of photograph, images, indicia and the like, which comprises:

a plastic support and one or more exposed and developed photosensitive zones carried on at least one of the major surfaces of said support, said zone comprising an exposed and developed layer of a photosensitive composition comprising an intimate mixture of (a) at least one photosensitive diazonium salt, (b) a coupling agent for said salt, and (c) at least one first thermally activated adhesive resin having a VICAT softening point in the range of from about 40° C. to about 140° C., the weight ratio of the salt plus coupling agent to the adhesive resin being from about 50:50 to about 5:95; said photosensitive zones having been exposed to actinic light through an original to be reproduced, to decompose the diazonium salt in the exposed portions of said zones, the unexposed portions of said zones having been developed in an alkaline medium to form photograph, images, indicia, and the like and then dried; and

a protective plastic film consisting essentially of, or having at least one surface layer consisting essentially of, a second thermally activated adhesive resin having a VICAT softening point in the range of 40° C. to 140° C., and laminated to the layer side of said support and the dried, developed photosensitive composition; wherein at least one of said support and said protective plastic film is transparent, whereby the information provided by the developed photosensitive composition can be viewed.

---

**4,370,398**

## ELECTROSTATIC COPYING PROCESS

**Tsutomu Sato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Apr. 18, 1980, Ser. No. 141,514**

**Claims priority, application Japan, Apr. 26, 1979, 54-51915; Oct. 13, 1979, 54-131991; Oct. 15, 1979, 54-131801**

**Int. Cl.³ G03G *13/01, 13/22***

**U.S. Cl. 430—42** **8 Claims**

1. An electrostatic copying process comprising the steps of:

(a) providing a photoconductive member having a conductive substrate, an inner photoconductive layer formed on the substrate and an outer photoconductive layer formed on the inner layer;

(b) forming an electrostatic charge of a first polarity at an interface of the inner and outer layers;

(c) radiating a light image onto the outer layer to form an electrostatic image corresponding thereto at the interface through localized photoconduction; and

(d) repeatedly applying toner to the outer layer to form toner images thereon and transferring the toner images to respective copy sheets;

the process further comprising the step, performed between steps (b) and (c), of:

(e) applying a charge of a second polarity which is opposite to the first polarity to the outer layer;

step (e) comprising applying the charge of the second polarity having a magnitude such that a surface potential on the photoconductive member has the first polarity after step (b) and also step (e);

charge dissipation time constants for the inner and outer layers provided in step (a), a magnitude of the charge of the first polarity applied in step (b) and the magnitude of the charge of the second polarity applied in step (e) being selected in such a manner that an increase in the surface potential as a function of time due to charge dissipation in the inner and outer layers is substantially equal to a decrease in the surface potential as a function of time due to charge leakage in step (d).

---

**4,370,399**

## EQUISENSITIVE AMBIPOLAR INDIUM DOPED SELENIUM CONTAINING ELECTROPHOTOGRAPHIC MATERIALS, PLATES AND METHOD

**Syamal K. Ghosh, Elk Grove Village, and Frank D. Kelly, Chicago, both of Ill., assignors to A. B. Dick Company, Niles, Ill.**

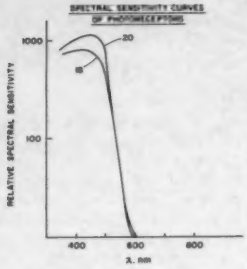
**Filed Mar. 23, 1981, Ser. No. 246,605**

**Int. Cl.³ G03G *5/04***

**U.S. Cl. 430—58** **10 Claims**

1. An ambipolar electrophotograhic plate comprising a

conductive substrate and a photoconductive layer on the substrate in which the photoconductive layer comprises selenium




doped with indium in an amount within the range of 10–500 ppm.

---

**4,370,400**

## DRY TRANSFER OF ELECTROPHOTOGRAPHIC IMAGES

**Sidney Cooper, Roslyn Harbor, and Ezekiel J. Jacob, Brooklyn, both of N.Y., assignors to Ani-Live Film Service Inc., New York, N.Y.**

**Division of Ser. No. 799,476, May 23, 1977, Pat. No. 4,216,283. This application Jan. 16, 1980, Ser. No. 112,827**

**Int. Cl.³ G03G *13/16***

**U.S. Cl. 430—126** **11 Claims**

1. A carrier sheet used in (A) an electrophotographic process comprising depositing an image by electrophotographic means, upon said (a) carrier sheet, corresponding to information to be recorded, forming a pattern of a toner composition on said carrier sheet corresponding to said electrostatic image thereby forming a toner-image, said carrier sheet being abhesive toward said toner-developed (deposited) image comprising an intumescent electroscopic powder mixture comprising a thermoadhesive agent containing microspheres carrying or containing adhesive.

---

**4,370,401**

## LIGHT SENSITIVE, THERMALLY DEVELOPABLE IMAGING SYSTEM

**John M. Winslow, South St. Paul, and Kenneth G. Gatzke, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 101,196, Dec. 7, 1979, abandoned. This application Oct. 24, 1980, Ser. No. 200,323**

**Int. Cl.³ G03C *1/52***

**U.S. Cl. 430—178** **18 Claims**

1. An imageable layer comprising (a) a polymeric binder, (b) a bleachable dye or a leuco dye, (c) a nitrate salt, and (d) a photosensitive diazonium salt, said nitrate salt in said imageable layer being capable of liberating $HNO_3$, NO, $NO_2$ or $N_2O_4$ in oxidizing amounts when said layer is heated to no more that 200° C. for 60 seconds.

---

**4,370,402**

## DYE REDUCING COMPOSITION FOR DYE TRANSFERS, PHOTOGRAPHIC TRANSPARENCIES AND COLOR PRINTS

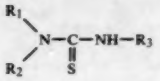
**Harry Anderson, 83 Morgan St., Apt. 3 J, Stamford, Conn. 06905**

**Filed Sep. 24, 1980, Ser. No. 190,359**

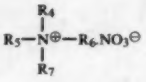
**Int. Cl.³ G03C *5/54*; D06L *3/00***

**U.S. Cl. 430—237** **14 Claims**

1. An aqueous composition for removing dyes from or reducing dye intensity in photographic color dye transfers and for removing or reducing the intensity of retouching dyes in color transparencies and color prints, which composition comprises, per 100 parts by weight of water, from about 1 to about 10 parts by weight of a thiourea compound of the formula:



wherein $R_1$ is hydrogen, methyl or ethyl, and $R_2$ and $R_3$ are each hydrogen or alkyl of from 1 to 4 carbon atoms, and from about 5 to about 20 parts by weight of an ammonium nitrate compound of the formula



wherein $R_4$ represents hydrogen, $C_1$–$C_{22}$ alkyl which may be mono- or poly-substituted by halogen or hydroxy or which may be interrupted by an amido group; or a $C_6$–$C_{10}$ aralkyl or alkaryl group optionally substituted by halogen or hydroxy, $R_5$ represents hydrogen, $C_1$–$C_8$ alkyl optionally substituted by hydrogen or hydroxy, or $C_6$–$C_{10}$ aralkyl or alkaryl optionally substituted by halogen or hydroxy, and each of $R_6$ and $R_7$ represents hydrogen or $C_1$–$C_4$ alkyl optionally substituted by halogen or hydroxy.

---

**4,370,403**

## PHOTOPOLYMERIZABLE RADIATION-SENSITIVE RESIN COMPOSITION AND RADIATION-SENSITIVE SHEET MATERIAL

**Kiyofumi Takaki, Yao, Japan, assignor to Tokuji Arai, Yokohama, Japan and Birger Takle, Asker, Norway**

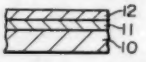
**PCT No. PCT/JP80/00198, § 371 Date Apr. 24, 1981, § 102(e) Date Apr. 24, 1981, PCT Pub. No. WO81/00626, PCT Pub. Date Mar. 5, 1981**

**PCT Filed Aug. 28, 1980, Ser. No. 261,175**

**Claims priority, application Japan, Aug. 28, 1979, 54-108570**

**Int. Cl.³ G03C *1/78***

**U.S. Cl. 430—271** **15 Claims**




1. A photopolymerizable radiation-sensitive resin composition comprising a styrene-maleic acid copolymeric resin, and, a combination of an ethylenically unsaturated compound which is a mixture of the following compounds (A) and (B):

(A) one or more ethylenic compounds having a molecular weight of 150 or more, a boiling point, under normal pressure, of 100° C. or more, at least one acryloyl or methacryloyl group, and a terminal hydroxyl group, and;

(B) one or more ethylenic compounds having a molecular weight of 150 or more, a boiling point, under normal pressure, of 100° C. or more, and at least one acryloyl or methacryloyl group and no terminal hydroxyl group;

and a photopolymerization initiator which comprises benzyl and dimethyl amino benzaldehyde.

4,370,404

## DESENSITIZING SOLUTION FOR LITHOGRAPHIC PRINTING PLATE

Hiromichi Tachikawa; Yohonosuke Takahashi; Kazuo Ishii; Tomoaki Ikeda, and Fumiaki Shinozaki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 78,267, Sep. 24, 1979, Pat. No. 4,328,304. This application Nov. 5, 1981, Ser. No. 318,495

Claims priority, application Japan, Sep. 22, 1978, 53-117728

Int. Cl.³ G03F 7/02

U.S. Cl. 430—302 19 Claims

1. A process for preparing a lithographic printing plate which comprises exposing a lithographic printing plate forming material having a photopolymerizable photosensitive layer containing an ethylenically unsaturated compound, developing said exposed material and treating the exposed material with a desensitizing solution comprising a free radical photopolymerization inhibitor, a hydrophilic colloid and water, said free radical photopolymerization inhibitor being present in the desensitizing solution in an amount sufficient to normally prevent selectively the formation of stain on non-imaged areas during printing.

---

4,370,405

## MULTILAYER PHOTORESIST PROCESS UTILIZING AN ABSORBANT DYE

Michael M. O'Toole, San Jose; En-Den D. Liu, Mountain View, and Mark S. Chang, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 30, 1981, Ser. No. 248,927

Int. Cl.³ G03C 5/00

U.S. Cl. 430—312 3 Claims

1. An improved process of photoetching a substrate having surface topography, of the type wherein a first material is deposited over the substrate to produce a planarizing layer which is thick enough that it has a substantially planar top surface in spite of the underlying topography, a resist is deposited above the planarizing layer to form a resist layer thereby producing a multilayer substrate coating having the planarizing layer sandwiched between the substrate and the resist layer, the resist layer is exposed to light in a range in which the resist is sensitive, said light having been passed through a mask to expose only selected portions of the resist layer, the resist layer is developed to produce a pattern, and the layers of the substrate coating between the resist layer and the substrate are processed to replicate the pattern in such layers, the improvement comprising:

selecting a dye which strongly absorbs light at the wavelengths used to expose the resist layer; and

dissolving the dye in a layer which is sandwiched between the substrate and the resist layer.

---

4,370,406

## DEVELOPERS FOR PHOTOPOLYMER LITHOGRAPHIC PLATES

Thomas H. Jones, Naperville, Ill., assignor to Richardson Graphics Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 107,452, Dec. 26, 1979, abandoned, which is a continuation of Ser. No. 900,276, Apr. 26, 1978, abandoned. This application May 12, 1981, Ser. No. 263,073

Int. Cl.³ G03C 5/24, 5/34; G03F 7/02, 7/08

U.S. Cl. 430—331 14 Claims

1. A composition which is a developer or developer solution replenisher for photopolymeric lithographic plates, the developer composition being of the non-emulsion subtractive type that is a single-phase solution consisting of an active solvent in admixture with a water miscible cosolvent and water, said active solvent having a water solubility concentration at which it is partially water insoluble or only partially soluble within the total developer composition, said active solvent also being a good solvent for unexposed photopolymer of a lithographic plate, which photopolymer is insolubilized upon exposure to actinic radiation, said active solvent being ethylene glycol monobutyl ether acetate, said cosolvent being selected from the group consisting of water-miscible alcohols, glycols, glycol ethers, ketones and acetates, and said active solvent being dissolved within the total composition in admixture with said water-miscible cosolvent at an unexposed photopolymer swelling concentration at which said active solvent migrates out of the developer composition to swell the unexposed photopolymer of the exposed and imaged lithographic plate for subsequent removal thereof from the plate, said photopolymer swelling concentration of the active solvent being no more than 10 weight percentage points less or greater than said water solubility concentration of the active solvent, based on the weight of the total developer composition.

---

4,370,407

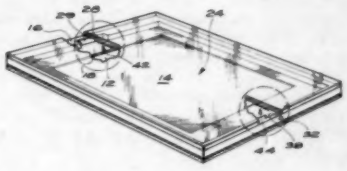
## PHOTOGRAPHIC PRODUCTS INCLUDING LIQUID SPREADING MEANS

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 143,230, Apr. 24, 1980, abandoned. This application Jul. 13, 1981, Ser. No. 282,616

Int. Cl.³ G03C 5/54, 1/76, 1/40, 5/24

U.S. Cl. 430—403 16 Claims




16. A method of processing a photographic film unit with low viscosity processing liquid, said method comprising the steps of:

introducing processing liquid having a viscosity in the range of 0 to 250 centipoises into a space between first and second sheets of the film unit for spreading in both the lateral and longitudinal direction within the space to process an imaging portion of one of the sheets, and

inhibiting movement of the wavefront of the liquid in the longitudinal direction to the imaging portion until the wavefront extends across the entire width of the imaging portion, transversely of the longitudinal direction.

---

4,370,408

## METHOD FOR REPAIRING SURFACE DEFECTS IN AN IMAGE OR PICTURE FILM

Hans Kiening, Hoehenbergweg 15, D-8170 Bad Toelz, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,082

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3026029

Int. Cl.³ G03C 5/24

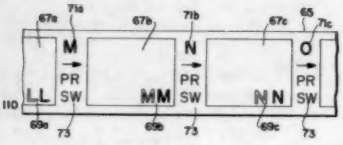
U.S. Cl. 430—432 5 Claims

1. A method for repairing surface defects such as depressions and scratches in picture films including a carrier film portion, comprising the steps of feed advancing the developed film to a utilization station, providing a continuous feed advance zone for the film upstream of said utilization station as viewed in the feed advance direction of the film, spraying a predetermined quantity of repair liquid onto the film surface at said continuous feed advance zone, and dosing said predetermined quantity of repair liquid so that it is sufficient to form a layer on the film which has a layer thickness of a few microns, preferably 1 to 5 microns, said layer thickness being sufficiently thin to assure a quick evaporation on any undamaged film surface portions while simultaneously providing such an accumulation of repair

liquid in said depressions and scratches that evaporation from these depressions and scratches is substantially delayed.

---

4,370,409
FILM IDENTIFICATION METHOD
Theodore Bostroem, 470 Park Rd. Extended, Middlebury, Conn. 06762
Filed Jun. 24, 1981, Ser. No. 277,038
Int. Cl.³ G03C 1/76
U.S. Cl. 430—496 17 Claims




12. A photographic film comprising:
an undeveloped photographic film strip having exposure zones and areas adjacent said exposure zones;
first exposure identification indicia positioned in said areas adjacent said exposure zones, individual ones of said first indicia being associated with separate exposure zones for individually identifying said exposure zones; and
second exposure identification indicia corresponding to said first indicia and of a size relatively smaller than said first indicia, said second indicia being disposed within said exposure zones.

---

4,370,410
SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL
Toshifumi Iijima, Kokubunzi; Wataru Fujimatsu, Hachioji, and Kaoru Onodera, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan
Filed Dec. 23, 1981, Ser. No. 333,899
Claims priority, application Japan, Dec. 26, 1980, 55-187438
Int. Cl.³ G03C 1/76
U.S. Cl. 430—505 6 Claims

1. A silver halide color photosensitive material for taking a photograph comprising a red photosensitive silver halide emulsion layer, a green photosensitive silver halide emulsion layer and blue photosensitive silver halide emulsion layer and each of which comprises a coupler out of every three kinds of the couplers, namely, anti-diffusive yellow, magenta and cyan couplers, and in which said green photosensitive silver halide emulsion layer is composed of at least two layers and between those of which said red photosensitive silver halide emulsion layer is arranged, and said green photosensitive silver halide emulsion layer comprises an anti-diffusive yellow coupler.

---

4,370,411
METHOD FOR PRODUCING A LONG SCALE DIRECT-POSITIVE PHOTOGRAPHIC EMULSION
Richard J. Byer, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 11, 1980, Ser. No. 186,291
Int. Cl.³ G03C 1/36
U.S. Cl. 430—596 5 Claims

1. A direct-positive photographic element comprising a support having coated thereon a single chemically fogged direct-positive silver halide emulsion, the silver halide grains of which have been fogged to a continuously varying degree and exhibit a multitude of photographic sensitivities within the same emulsion, whereby a Density vs. Log of Exposure curve of said element provides extended exposure latitude and exhibits no discrete steps.

---

4,370,412
AQUEOUS HYDROPHILIC COLLOID COATING COMPOSITION CONTAINING A COMBINATION OF ANIONIC SURFACTANTS
Susan J. Cruikshank, and Michael W. Orem, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 14, 1978, Ser. No. 942,201
Int. Cl.³ G03C 1/76, 1/38; C08K 89/00
U.S. Cl. 430—635 2 Claims

2. A photographic element comprising a support and at least one layer containing gelatin, sodium dodecyl sulfate and sodium lauroyl sarcosinate, the combined weight of said sodium dodecyl sulfate and said sodium lauroyl sarcosinate being in the range of from about 0.5 to about 3 parts per 100 parts by weight of gelatin, and said sodium dodecyl sulfate being present in an amount of from about 0.3 to about 2 parts per part by weight of said sodium lauroyl sarcosinate.

---

4,370,413
MICROMETHOD FOR THE DETERMINATION OF ENDOTOXINS
Ishak Neeman, Haifa, Israel, and Stephen L. Gaffin, Durban, South Africa, assignors to Technion Research and Development Foundation, Ltd., Haifa, Israel
Filed Feb. 17, 1981, Ser. No. 235,153
Claims priority, application Israel, Feb. 14, 1980, 59383
Int. Cl.³ C12Q 1/06, 1/29, 1/04; C12M 1/34
U.S. Cl. 435—39 8 Claims

1. A micromethod for the quantitative determination of endotoxins with Limulus Amebocyte Lysate (L.A.L.) reagent, which comprises the steps of: (a) admixing the sample containing the endotoxins with a microamount of L.A.L. reagent; (b) introducing the mixture into a capillary tube; (c) incubating the capillary tube at a temperature range of 20° to 40° C.; (d) measuring the hydrostatic pressure required to cause the formed viscous mass to flow from said capillary tube; and (e) determining the quantity of endotoxin in the sample by comparing the measured hydrostatic pressure to a previously determined standard relating hydrostatic pressure to endotoxin content.

---

4,370,414
PROCESS FOR PRODUCING 6-AMINOPENICILLANIC ACID AND 6-AMINOPENICILLANIC ACID S-OXIDE
Takashi Mitsugi, Izumiotsu; Ryonosuke Muneyuki, Kyoto; Yoshiharu Wakisaka, Takarazuka; Kenzo Koizumi, Sakai, and Eiji Kondo, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
Filed Oct. 6, 1980, Ser. No. 194,277
Claims priority, application Japan, Oct. 30, 1979, 54-140928
Int. Cl.³ C12P 37/06; C12R 1/06
U.S. Cl. 435—44 4 Claims

1. A process for producing 6-aminopenicillanic acid S-oxide which comprises contacting benzylpenicillin S-oxide with enzyme produced by a microbe belonging to Arthrobacter genus.

---

4,370,415
PROCESS FOR PRODUCING UROPORPHYRIN III
Ichiro Kojima, Yokosuka; Kenji Maruhashi, Yokohama, and Yasuo Fujiwara, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan
Filed Nov. 7, 1980, Ser. No. 204,789
Claims priority, application Japan, Nov. 7, 1979, 54-143198
Int. Cl.³ C12P 17/18
U.S. Cl. 435—119 7 Claims

1. A process for producing uroporphyrin III, which comprises cultivating a uroporphyrin III-producing microorgan-

ism of *Arthrobacter hyalinus, Arthrobacter pascens* or a variety or mutant thereof in a culture medium containing a carbon source, a nitrogen source and a mineral, and recovering uroporphyrin III from the culture broth.

---

**4,370,416**

## HYDROXY-CINNAMIC ACID ESTER HYDROLASE AND PROCESS FOR PRODUCING SAME

**Shigemichi Okamura, Noda, and Masazumi Watanabe, Kashiwa, both of Japan, assignors to Kikkoman Corporation, Noda, Japan**

**Filed Nov. 27, 1981, Ser. No. 325,182**

**Claims priority, application Japan, Dec. 8, 1980, 55-172118**

**Int. Cl.**[3] **C12N** *9/18;* **C12P** *7/42;* **C12G** *1/02;* **A23F** *5/16;* **A23L** *2/34;* **C12P** *7/62*

**U.S. Cl. 435—197** **8 Claims**

1. A novel hydroxy-cinnamic acid ester hydrolase having the following characteristic properties:

(1) It is a novel hydroxy-cinnamic acid ester hydrolase which specifically hydrolyzes the ester linkage of hydroxy-cinnamic acid ester substances represented by the following general formula:

wherein R is hydrogen atom, hydroxyl group or methoxyl group and X is tartaric acid residue or quinic acid residue, and has no tannic acid-decomposing activity substantially;

(2) Its optimum pH for its action is about 6.5 and its stable pH range is 3 to 7.5;

(3) Its action temperature is in the range of 20° to 60° C., in particular, 45° to 60° C.;

(4) It completely loses its activity when heat-treated at 70° C. for 10 minutes, and it keeps survived 80% of its activity when heat-treated at 60° C. for 10 minutes;

(5) It is inhibited by $Hg^{++}$, $Fe^{++}$, 8-hydroxyquinoline, iodine and diisopropylfluorophosphoric acid, and there is no particular activator nor stabilizer for it;

(6) It has a molecular weight of 150,000 as measured at 4° C. in 0.1 M citrate buffer solution having a pH value of 5.0; and

(7) It is an acidic protein having an isoelectric point of PI 4.8.

---

**4,370,417**

## RECOMBINANT DEOXYRIBONUCLEIC ACID WHICH CODES FOR PLASMINOGEN ACTIVATOR

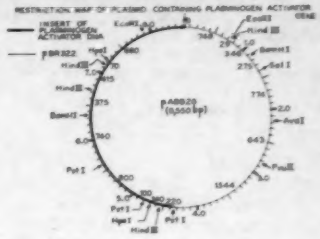
**Paul P. Hung, Waukegan; Shaw-Guang Lee, Libertyville; Ranajit Roychoudhury, Wadsworth, all of Ill.; Barry J. Ratzkin, Houston, Tex.; W. Jürgen Schrenk, Weilheim, Fed. Rep. of Germany, and Michael C. Chen, Painted Post, N.Y., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed Apr. 3, 1980, Ser. No. 137,032**

**Int. Cl.**[3] **C12P** *21/00;* **C12N** *15/00*

**U.S. Cl. 435—212** **25 Claims**

1. A recombinant plasmid adapted for transformation of a microbial host said plasmid comprising a plasmid vector into which a polydeoxyribonucleotide segment which codes for plasminogen activator protein has been inserted.




17. A polydeoxyribonucleotide segment which codes for plasminogen activator protein.

---

**4,370,418**

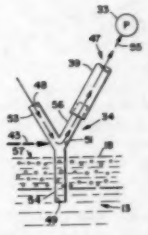
## LIQUID LEVEL CONTROL BY SUBSURFACE DRAW OFF

**Benjamin L. Koopman, Gainesville, Fla.; Antonio O. Lau, Morristown; Peter F. Strom, Highland Park, both of N.J., and David Jenkins, Kensington, Calif., assignors to University of California, Berkeley, Calif.**

**Filed Jul. 24, 1981, Ser. No. 286,372**

**Int. Cl.**[3] **C12M** *1/36*

**U.S. Cl. 435—289** **10 Claims**



1. In a fluid system having a vessel which receives an inflow of liquid and having a liquid level control for maintaining a predetermined liquid level in the vessel and which includes a discharge pump for withdrawing liquid from said vessel, the improvement comprising:

discharge flow intake structure having a branched discharge flow intake path which includes a first inlet situated above said predetermined liquid level, a second inlet situated below said predetermined liquid level, and a flow junction situated at said predetermined liquid level, said pump being communicated with both of said first and second inlets through said flow junction, wherein said liquid in said vessel has a surface layer with a composition differing from that of the subjacent volume of said liquid in said vessel, wherein said second inlet of said discharge flow intake structure is situated below said surface layer and within said subjacent volume of said liquid, wherein said discharge flow intake structure includes a first tubulation extending upwardly from said flow junction and having an opening above said flow junction constituting said first inlet, a second tubulation extending downwardly from said flow junction and having an opening below said flow junction constituting said second inlet, and a third tubulation extending upwardly from said flow junction at an angle with respect to said first tubulation to communicate said flow junction with said discharge pump.

## 4,370,419

## TRAY FOR IDENTIFYING MICROORGANISMS

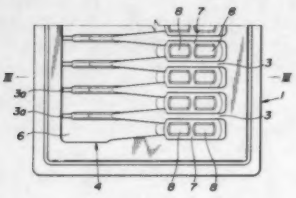
**Tamotsu Iida, Oyama; Seiji Enomoto, Saitama, and Michiya Kimura, Oyama, all of Japan, assignors to Eiken Chemical Co., Ltd., Tokyo, Japan**

**Filed Jul. 15, 1981, Ser. No. 283,473**

**Claims priority, application Japan, Mar. 18, 1981, 56-38022[U]**

**Int. Cl.³ C12M *1/20***

**U.S. Cl. 435—301** **3 Claims**



**1.** A tray for identifying microorganisms, comprising:

a tray body, comprising:

a first wall which defines an interior space;

a plurality of parallel cells extending across said interior space;

a plurality of parallel partition walls separating said cells and extending across said interior space, having a height substantially equal to that of said first wall;

a plurality of crest barriers extending substantially perpendicularly across substantially the middles of said cells between pairs of said partition walls and dividing each of said cells into a flat bottomed cell for bacterial suspension and a small cell, each of said crest barriers having a gradual slope portion rising from one of said cells for bacterial suspension and a steep slope portion rising substantially vertically from one of said small cells, said crest barriers each having a height less than that of said partition walls, each of said partition walls having a reduced height portion abutting said first wall adjacent a pair of said cells for bacterial suspension, each of said small cells being wider than said crest barriers and having a bottom with at least two wells, each of said crest barriers decreasing in width from said cell for bacterial suspension to said small cell; and

a cover fitting over said tray body comprising:

a top;

a peripheral wall; and

a lower lip, said peripheral wall and said lower lip being provided with a plurality of outwardly bulging vent passages to allow communication of the interior space of said tray body with the atmosphere.

---

## 4,370,420

## PREPARATION OF DRIED BAKER'S YEAST

**Philippe Clement, Roubaix, and Jean-Paul Rossi, Marcq en Baroeul, both of France, assignors to Societe Industrielle LeSaffre, Paris, France**

**Continuation-in-part of Ser. No. 702,019, Jul. 2, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,726**

**Claims priority, application France, Jul. 3, 1975, 75 20943**

**The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.**

**Int. Cl.³ C12N *1/18***

**U.S. Cl. 435—256** **8 Claims**

**1.** A process for preparing a yeast composition in solid particular form, consisting essentially of an active baker's yeast and an emulsifying agent, said process comprising successively

(1) selecting a yeast strain stable to drying, and which has the further characteristic in fresh compressed yeast form of releasing at least 105 ml of gas in test $A_1$, in two hours

wherein, in said test $A_1$, the said fresh baker's yeast in an amount corresponding to 160 mg of dry material, and diluted in 15 ml of water containing 27 g of NaCl and 4 g of $(NH_4)_2SO_4$ per liter, is added to 20 g of flour incubated at 30° C. and kneaded for 40 seconds to obtain a dough, maintaining said dough at 30° C. in a vessel for 13 minutes after the beginning of said kneading, thereafter hermetically sealing said vessel and measuring the total amount of gas produced, in ml at 30° C. and 760 mm of Hg, after the expiration of 120 minutes;

(2) cultivating said yeast strain discontinuously in a plurality of multiplication cycles, having several hours duration each, and carried out in vats previously provided with inoculating yeast and water, by regulated inflows of molasses and other nutrients including nitrogen and $P_2O_5$, harvesting the yeast the end of each multiplication cycle, and wherein during the last of said multiplication cycles, the cultivation conditions consisting essentially in the combination of:

(i) continuous inflows of the molasses;

(ii) maintaining a value of between about 3.8 and about 5 for the weight ratio of

$$\frac{\text{(Culture medium)}}{\text{(molasses)}}$$

wherein the term "(culture medium)" refers to the entire content of the culture vat including water, yeast and nutrient substances at the end of the last multiplication cycle, and

wherein the term "(molasses)" refers to the total quantity of molasses introduced into the vat during said last multiplication cycle,

(iii) regulating the respective inflows of molasses nitrogen and $P_2O_5$ such that the yeast harvested at the end of the last multiplication cycle has

(A) an amount of buds which is less than 5%, and

(B) a protein content in said yeast in an amount which corresponds to the optimum activity of the selected strain, wherein the said optimum activity is the activity which corresponds to the protein content of the yeast for which a higher protein content gives no more than a slight gain in activity and will cause a definite deterioration in the stability of the yeast, and

(C) the following characteristics

(a) a trehalose content in the dry matter of at least 12%

(b) a ratio of nitrogen to $P_2O_5$ content of between 2.3 and 3.8; and

harvesting the thus-cultivated yeast at the end of said last multiplication cycle,

(3) thereafter separating, washing and filtering or compressing the thus-cultivated and harvested yeast so as to obtain a compressed yeast having the characteristic that the supernatant liquid obtained by centrifuging a cream formed of 100 g of said compressed yeast containing 30–35% of dry matter, and admixing the same with 30 g of demineralized water will exhibit a cryoscopic lowering of at most 0.3° C.;

(4) then adding to said thus-obtained compressed yeast an emulsion of an emulsifying agent having an HLB value of between 3 and 11 in water and having film forming properties sufficient to provide adequate protection and to facilitate its reconstitution in use, and said emulsifying agent being between about 0.5 and 2% by weight of the finished dry yeast product; and

(5) finally, dividing into fine particles the thus-obtained compressed yeast emulsifying agent composition and drying the same in particulated condition under gentle drying conditions, either by flash pneumatic conveyor drying, or fluidized bed drying, or a combination of flash pneumatic conveyor drying and fluidized bed drying, and at least sufficient to reduce the water content thereof to the level of a dry matter content between 94% and 97%.

4,370,421

## ELECTRICALLY INSULATING SUBSTRATE AND A METHOD OF MAKING SUCH A SUBSTRATE

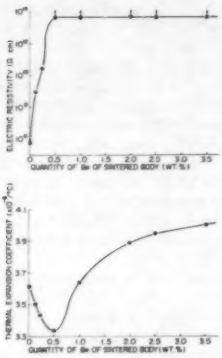
Yasuo Matsushita; Yukio Takeda; Kousuke Nakamura, and Tokio Okoshi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1980, Ser. No. 203,554

Claims priority, application Japan, Nov. 5, 1979, 54-142059; Jun. 6, 1980, 55-75601

Int. Cl.³ C04B 35/56; C22C 29/00

U.S. Cl. 501—88 8 Claims


ELECTRIC RESISTIVITY (Ω · cm)
QUANTITY OF Be OF SINTERED BODY (WT %)
THERMAL EXPANSION COEFFICIENT (×10⁻⁶/°C)
QUANTITY OF Be OF SINTERED BODY (WT %)

1. An electrically insulating substrate comprising a sintered body, said sintered body consisting essentially of 0.1 to 3.5 weight % of beryllium in the form of a compound consisting of beryllium oxide, up to 0.1 weight % of aluminum, up to 0.1 weight % of boron, up to 0.4 weight % of free carbon and a balance of silicon carbide, said sintered body having a density of at least 90% relative density with respect to the theoretical density of said silicon carbide, having a thermal conductivity of at least 0.4 cal/cm.sec.°C. at 25° C., having an electrical resistivity of at least $10^7$ Ohm.cm at 25° C. and having a coefficient of thermal expansion of up to $4\times10^{-6}$/°C. from 25° C. to 300° C.

8. An electrically insulating substrate made of a sintered body having a relative density of 90% or more, said sintered body consisting essentially of 0.1 to 3.5% by weight of beryllium in the form of beryllium oxide and a balance of silicon carbide, said sintered body being produced by sintering a mixture consisting essentially of beryllium oxide and a balance of silicon carbide having an average grain size of up to 10 μm in a non-oxidizing atmosphere at 1850° to 2500° C.

---

4,370,422

## PROCESS FOR THE PRODUCTION OF MAGNESIUM OXIDE FROM BRINE OR BITTERN

Jajnya D. Panda, and Santosh K. Mahapatra, both of Orissa, India, assignors to Dalmia Institute of Scientific and Industrial Research and Orissa Cement Limited, both of Orissa, India

Filed Dec. 16, 1980, Ser. No. 216,810

Claims priority, application United Kingdom, Apr. 30, 1980, 8014325

Int. Cl.³ C04B 9/14

U.S. Cl. 501—108 13 Claims

3. A process for the production of magnesium oxide from brine or bittern containing magnesium chloride in a concentration of at least 25° Be consisting essentially of

(a) adding to the brine or bittern, as a source of MgO and/or CaO, MgO or $Mg(OH)_2$ or calcined magnesite or calcined dolomite or calcined calcite/limestone in such amount that in the case of MgO, $Mg(OH)_2$ or calcined magnesite, the molar ratio of $MgO:MgCl_2$ is in the range of 1:1.5 to 1:15 (i.e. 0.66:1 to 0.066:) or, in the case of calcined dolomite, the molar ratio of $MgO+CaO:MgCl_2$ is in the range of 0.66:1 to 0.05:1, or, in the case of calcined calcite/limestone, the molar ratio of $CaO:MgCl_2$ is in the range of 0.66:1 to 0.1:1,

(b) keeping the mixture at a temperature below 90° C. till a solidified mass is formed;

(c) drying the said solid mass at a temperature up to 200° C.;

(d) calcining the said mass at a maximum temperature of 1200° C.; and

(e) briquetting the calcined mass into desired shapes with the addition of organic or inorganic binder, and firing the said briquettes at above 1400° C.

7. A process according to claim 3, which comprises the addition of chromite or chrome ore in addition to the binder.

---

4,370,423

## FAST-CURING FOAMABLE COMPOSITION BASED ON ETHYLENE TERPOLYMERS

John Rys-Sikora, Bel Aire, Md., assignor to Bata Limited, Toronto, Canada

Filed Sep. 18, 1981, Ser. No. 303,479

Int. Cl.³ C08J 9/10

U.S. Cl. 521—84 9 Claims

1. A foamable composition comprising:

(a) a terpolymer consisting of

(i) ethylene;

(ii) 10 to 40 percent by weight of a softening monomer selected from the group consisting of alkyl acrylates and methylacrylates having linear or branched alkyl groups of 1 to 18 carbon atoms, vinyl ethers of saturated carboxylic acids having 1 to 18 carbon atoms and vinyl alkyl ethers wherein the alkyl group contains 1 to 18 carbon atoms; and

(iii) 1.0 to 20 percent by weight carbon monoxide such that the melt index of the terpolymer is 0.5 to 500;

(b) a free radical crosslinking agent; and

(c) a chemical blowing agent.

---

4,370,424

## PLASTIC AND FOAM PLASTIC AND METHOD FOR MAKING THEM

Heinz Baumann, Kleinniedesheim, Fed. Rep. of Germany, assignor to Schaum-Chemie W. Bauer GmbH & Co KG, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 65,039, Aug. 9, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,028

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834794

Int. Cl.³ C08J 9/30

U.S. Cl. 521—121 13 Claims

1. A method for making a plastic foam comprising intimately mixing a concentrated acidic aqueous solution of a phenol and a sulfonic acid, the concentrated solution having a water content of about 20 to 30% by weight, with a foamed solution of an aldehyde and a tenside, and permitting the foam to harden.

---

4,370,425

## PROCESS FOR OBTAINING PERMANENTLY SELF-EXTINGUISHING CELLULAR MATERIALS WHICH HAVE A LOW DENSITY AND HIGH MECHANICAL CHARACTERISTICS

Giancarlo Carignani, Roma, and Aldo Cipriani, Colleferro, both of Italy, assignors to Shia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Nov. 5, 1980, Ser. No. 204,254

Claims priority, application Italy, Nov. 20, 1979, 27441 A/79

Int. Cl.³ C08V 9/30; C08L 67/00

U.S. Cl. 521—138 6 Claims

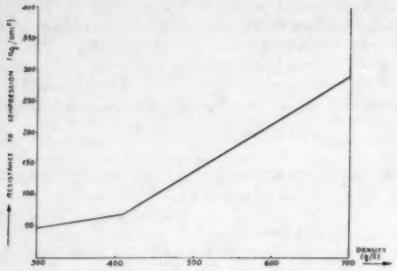
1. Permanently self-extinguishing cellular materials consisting essentially of brominated unsaturated polyester resins con-

taining an amount of bound bromine of between 10 and 30%, said cellular materials being characterized in that

(a) they have been obtained by mechanical incorporation of gas into a brominated unsaturated polyester resin prepared by bromination of an alkyd, containing units derived from tetra-hydrophthalic anhydride in its chains in an amount higher than 20% by weight of the alkyd, and by subsequent dilution with styrene and/or vinyltoluene, until cross-linkable liquid foams are obtained, which latter foams are subsequently subjected to cross-linking;

(b) they have a density below 700 grams per liter; and

(c) they have a resistance to compression, as a formed product, higher than 50 kg per $cm^2$, correlated to the density according to the attached FIG. 1.




---

**4,370,426**

## BINDER FOR MANUFACTURING TUFTED FLOOR COVERINGS

**Jean-Claude Daniel, Fontenay; Jacques Grossoleil, Paris, and Robert Roullet, Lyons, all of France, assignors to Rhone-Poulenc Industries, Paris, France**

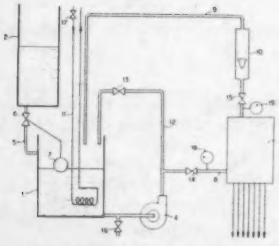
**Division of Ser. No. 898,955, Apr. 21, 1978, Pat. No. 4,246,309. This application Aug. 15, 1980, Ser. No. 178,468**

**Claims priority, application France, Apr. 22, 1977, 77 12160**

**The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.**

**Int. Cl.³ C08J *3/00***

**U.S. Cl. 523—310** **2 Claims**



**1.** Process for preparing a binder of an aqueous latex base binder of a synthetic styrene-butadiene copolymer for use in the manufacture of tufted floor coverings having improved wear resistance in which the content in the latex of water soluble compounds dissolved in the aqueous phase is less than 0.5% by weight in relation to the polymer, comprising subjecting a latex of a styrene-butadiene copolymer prepared by emulsion polymerization in aqueous medium to ultrafiltration through a semi-permeable membrane having a cutoff within the molecular range of 5,000 to 100,000 to remove a sufficient quantity of hydrosoluble compounds, adding water to the latex during the ultrafiltration to maintain a substantially constant ponderal content of the latex in dry material between 5–70% during the filtration step.

---

**4,370,427**

## ALKYLATED ISOADIPOGUANAMINE-FORMALDEHYDE CROSSLINKING RESIN AND IMPROVED COATING COMPOSITIONS PRODUCED THEREFROM

**Francis E. Schweitzer, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 176,551, Aug. 8, 1980. This application Oct. 29, 1981, Ser. No. 316,110**

**Int. Cl.³ C08L *33/02, 63/02, 67/02, 67/08***

**U.S. Cl. 523—400** **9 Claims**

**1.** An improved coating composition of the kind having:

(1) binder constituents consisting essentially of a film-forming material and a crosslinker for the film-forming material, wherein the film-forming material is selected from the group consisting of acrylic resins, polyester or alkyd resins, and epoxy resins, or mixtures of these, and

(2) a solvent for the binder constituents, wherein the improvement is characterized in that the crosslinker for the film-forming material is an alkylated isoadipoguanamine-formaldehyde resin consisting essentially of the reaction product of:

(1) an isoadipoguanamine mixture consisting essentially of:

(a) about 87–95 percent by weight, based on the weight of the isoadipoguanamine mixture, of 2-methyl-glutaroguanamine,

(b) about 4–12 percent by weight, based on the weight of the isoadipoguanamine mixture, of 2-ethylsuccinoguanamine, and

(c) about 1–2 percent by weight, based on the weight of the isoadipoguanamine mixture, of adipoguanamine;

(2) from 3–6 moles of formaldehyde per mole of said isoadipoguanamine mixture; and

(3) a stoichiometric excess of an aliphatic alcohol having 1–4 carbon atoms or of a mixture of such alcohols.

---

**4,370,428**

## PIGMENTED PEROXIDE AND POLYESTER COMPOSITIONS

**Carlos R. Danville, 4505 Gilhouse St., Toledo, Ohio 43623**

**Filed Oct. 17, 1980, Ser. No. 197,798**

**Int. Cl.³ C08K *5/00*; C08L *67/00***

**U.S. Cl. 523—508** **10 Claims**

**1.** A polyester resin composition comprising a polyester resin, and fillers, the improvement comprising an amount of from 0.025 weight percent to 0.40 weight percent based on the total weight of the resin of 1-[(4-methyl-2-nitrophenyl)azo]-2-naphthalenol pigment.

---

**4,370,429**

## DISPERSING SOLID CARBONACEOUS MATERIAL IN WATER

**John B. Clarke, Bradford, and Leslie Pitts, Ilkley, both of England, assignors to Allied Colloids Limited, Bradford, England**

**Filed May 27, 1981, Ser. No. 267,485**

**Claims priority, application United Kingdom, May 31, 1980, 8017896**

**Int. Cl.³ C08K *3/20***

**U.S. Cl. 524—60** **9 Claims**

**1.** An aqueous slurry comprising solid particulate carbonaceous material, water and a stabilising amount of a dispersing agent, characterised in that the carbonaceous material is coke or coal and the dispersing agent comprises a quaternary ammonium synthetic polymer made by polymerisation of ethylenically unsaturated monomer or monomers and having a solution viscosity, as measured using a suspended level viscometer on a 1% solution in deionised water at 25° C., of 1 to 500 cs.

**4,370,430**

## HINDERED AMINE LIGHT STABILIZERS FOR POLYMERS

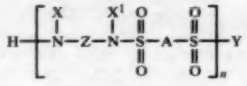
**Joseph A. Hoffman, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Aug. 31, 1981, Ser. No. 297,681**

**Int. Cl.³ C08K** *5/35, 5/34;* **C07D** *413/12, 401/12, 211/06*

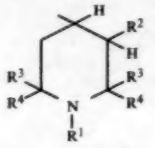
**U.S. Cl. 524—96** **13 Claims**

1. An oligomer of the formula (I)



(I)

wherein X and $X^1$ are the same or different, and represent hydrogen, $C_1$–$C_{20}$ alkyl, or the radical (II)

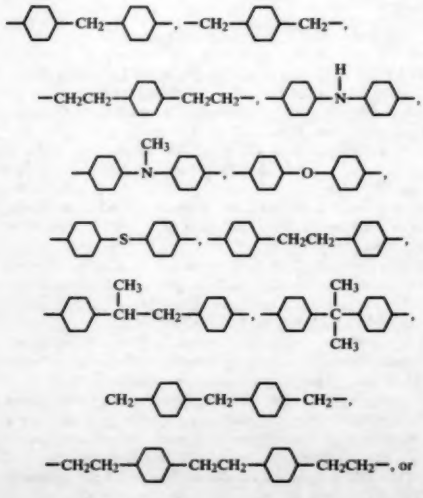


(II)

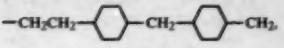
wherein $R^1$ represents hydrogen, $C_2$–$C_3$ hydroxyalkyl, $C_1$–$C_8$ alkyl, hydroxyl, or oxyl; $R^2$ represents hydrogen, $C_1$–$C_8$ alkyl, or benzyl; $R^3$ and $R^4$, which may be the same, or different, represent $C_1$–$C_8$ alkyl, benzyl, or phenethyl, or together with the carbon to which they are attached form a $C_5$–$C_{10}$ cycloalkyl,

Z represents $C_2$–$C_{20}$ alkylene, either straight-chained or branched, wherein the alkylene chain may be interrupted by oxy, thio, or

radicals, wherein $R^5$ represents hydrogen, $C_1$–$C_{20}$ alkyl, or the radical (II); $C_5$–$C_{10}$ cycloalkylene



-continued

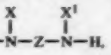


$C_6$–$C_{12}$ arylene, or $C_8$–$C_{16}$ aralkylene,

A is a $C_6$–$C_{12}$ arylene radical, or a substituted $C_6$–$C_{12}$ arylene wherein the substitutents, which may be the same, or different, are $C_1$–$C_8$ alkyl, $C_1$–$C_8$ alkoxy, $C_1$–$C_8$ alkylamino, or di($C_1$–$C_8$)alkylamino,

n is an integer greater than 1 and less than 5,

And, Y represents halo, $C_1$–$C_8$ alkylamino, di($C_1$–$C_8$)alkylamino, piperidyl, pyrrolidyl, morpholino, or



wherein X, $X^1$, and Z are as previously defined; with the proviso that at least one piperidinyl moiety of formula (II) is present in the repeating unit.

7. A method for stabilizing a polymer subject to degradation by ultraviolet radiation which comprises incorporating into said polymer an ultraviolet radiation stabilizingly effective amount of an oligomer of claim 1.

---

**4,370,431**

## PROCESS FOR COLORING FIBRE FORMING POLYAMIDES IN THE MELT WITH AZO PIGMENTS

**Paul Lienhard, Frenkendorf, and Armand Roueche, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

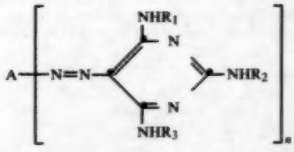
**Filed Aug. 10, 1981, Ser. No. 291,546**

**Claims priority, application Switzerland, Aug. 20, 1980, 6285/80**

**Int. Cl.³ C08L** *77/00*

**U.S. Cl. 524—100** **9 Claims**

1. A process for colouring fibre forming polyamides in the melt, which process comprises the use of an azo pigment of the formula



wherein A is the radical of a diazo or tetraazo component, $R_1$, $R_2$ and $R_3$ are hydrogen atoms or alkyl, cycloalkyl, phenylalkyl or aryl radicals, and n is 1 or 2.

---

**4,370,432**

## HOT MELT ADHESIVE COMPOSITIONS OF NEUTRALIZED SULFONATED EPDM AND TACKIFIER MIXTURE

**Pawan K. Agarwal, Westfield, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.**

**Filed Sep. 4, 1981, Ser. No. 299,592**

**Int. Cl.³ C08L** *23/32, 23/16, 23/20*

**U.S. Cl. 524—216** **11 Claims**

1. A hot melt adhesive composition which consists of:

(a) a neutralized sulfonated EPDM terpolymer having about 5 to about 50 meq. of neutralized sulfonated groups per 100 grams of said neutralized sulfonated EPDM terpolymer;

(b) about 25 to about 250 parts by weight of a polyisobutylene per 100 parts of the neutralized sulfonated polymer;

(c) about 25 to about 250 parts by weight of a hydrocarbon resin of a petroleum or coal tar distillate per 100 parts by weight of said neutralized sulfonated EPDM terpolymer; and

---

4,370,433

## HIGH STRENGTH DIENE/MONOVINYL AROMATIC COPOLYMER-BASED ADHESIVES

George M. Allison, III, Bartlesville, Okla., and Mason S. Wilt, Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 10, 1981, Ser. No. 282,216
Int. Cl.³ C08L 93/00; C08F 2/00, 4/00
U.S. Cl. 524—274 11 Claims

1. A method for producing a branched copolymer comprising copolymerizing conjugated diene monomers and monovinylaromatic monomers using a monolithium initiator and then reacting the resulting lithium terminated polymer segments with a coupling agent having at least three functional groups capable of reacting with the resulting lithium terminated polymer segments to couple said coupling agent and the lithium terminated polymer segments, said method being further characterized in that the copolymerization is carried out in the presence of an amount of tertiary butylchloride that will improve the holding power that the polymer will impart to a pressure sensitive adhesive composition.

---

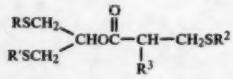
4,370,434

## MERCAPTO ACID ESTER ANTIOXIDANTS FOR POLYMERS

Richard H. Kline, Silver Lake, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 252,778, Apr. 10, 1981. This application Apr. 5, 1982, Ser. No. 365,115
Int. Cl.³ C08K 5/37
U.S. Cl. 524—289 6 Claims

1. A composition comprising (a) organic material selected from the group of oxidizable polymers, oils, resins, waxes and fuel containing an effective amount of a mixture of (b) a phenolic antioxidant, and (c) a compound of the formula I:



(I)

wherein R, R′ and $R^2$ are alkyl radicals having 1 to 20 carbon atoms, phenyl radicals which may be substituted by 1 or 2 alkyl groups having 1 to 8 carbon atoms, aralkyl radicals having 7 to 12 carbon atoms or cycloalkyl radicals having 5 to 12 carbon atoms and $R^3$ is hydrogen or an alkyl radical having 1 to 4 carbon atoms; the ratio of (c) to (b) ranging from 1 to 4 to 4 to 1.

---

4,370,435

## ASPHALT BASED COATINGS

Michael G. Roberts, and Joseph F. Tanner, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 26, 1981, Ser. No. 314,829
Int. Cl.³ C08K 5/10
U.S. Cl. 524—312 10 Claims

1. A composition comprising a solvent solution of a chemically modified asphalt and an oil based paint, the solvent solution and the vehicle of the paint being compatible.

4,370,436

## PROCESS FOR PREPARING FILLED POLYTETRAFLUOROETHYLENE MOLDING POWDER

Yukiharu Nakamura, Ibaraki, and Shoji Kawachi, Nishinomiya, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 7, 1981, Ser. No. 281,062
Claims priority, application Japan, Jul. 8, 1980, 55-93702
Int. Cl.³ C08K 5/01, 5/02; C08L 27/18, 43/04
U.S. Cl. 524—322 5 Claims

1. In a process for preparing a filled polytetrafluoroethylene molding powder by agitating finely-divided polytetrafluoroethylene particles having an average particle size of not more than 100 μm. and a particulate hydrophilic filler in water in the presence of a water-immiscible organic liquid, the improvement which comprises, agitating a mixture of water and a particulate hydrophilic filler which has been surface-treated with an aminosilane compound, said agitating being conducted in the presence of at least one member selected from the group consisting of a higher fatty acid having 12 to 18 carbon atoms and an anionic surface active agent; adding to the agitating mixture the finely-divided polytetrafluoroethylene particles and the water-immiscible organic liquid in that order; and agitating the resulting mixture for a time sufficient to agglomerate the particles.

---

4,370,437

## NITRITE-SORBATE STABILIZING SYSTEM

Kenneth W. Willcox, and James C. Randall, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 5, 1982, Ser. No. 345,967
Int. Cl.³ C08K 0/00
U.S. Cl. 524—397 22 Claims

1. A composition comprising:

(a) a linear or radial block copolymer of a conjugated diene and a monovinyl-substituted aromatic hydrocarbon;

(b) a metal nitrite; and

(c) a metal sorbate; wherein said metal nitrite and said metal sorbate are independently derived from the metals of Groups IA and IIA of the Periodic Table of Elements; wherein said metal nitrite and said metal sorbate are at least partly soluble in water; and wherein said metal nitrite and said metal sorbate are added in amounts sufficient to at least partially suppress get or fisheye formation or to improve thermal stability.

---

4,370,438

## POLYESTER BLEND COMPOSITIONS EXHIBITING SUPPRESSION OF TRANSESTERIFICATION

Andrea A. DeGuia, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 9, 1981, Ser. No. 252,563
Int. Cl.³ C08L 67/02
U.S. Cl. 524—412 29 Claims

1. A non-burning, non-dripping polyester blend composition exhibiting suppression of transesterification, said composition comprising:

(a) approximately 35 to 85% by weight of a blend of polyethylene terephthalate and polybutylene terephthalate wherein the polyethylene terephthalate comprises approximately 10 to 25% by weight of the blend;

(b) approximately 5 to 60% by weight of a reinforcing agent;

(c) approximately 4 to 15% by weight of at least one halogen containing organic flame retardant compound; and

(d) approximately 2 to 10% by weight of the amorphous non-abrasive reaction product of antimony trioxide or a compound of antimony which generates antimony trioxide and a substrate comprising a hydrous compound of silicon in a weight ratio within the range of approximately 1:1 to 1:4, on an antimony trioxide:substrate basis.

## 4,370,439
## METHOD OF PREPARING A SIZING COMPOSITION FOR TREATING GLASS FIBERS

**Carl A. Melle, Gibsonia; Donald E. McWilliams, Pittsburgh, and Balbhadra Das, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Mar. 22, 1979, Ser. No. 22,673**
**Int. Cl.³ C08L** *67/06*
**U.S. Cl. 524—513** **45 Claims**

1. A stable aqueous emulsion for incorporation into a sizing composition for treating glass fibers, comprising:

about 0.1 to about 10 parts per hundred parts of resin of unhydrolyzed amino-functional silane,

one hundred parts of a polyester resin having free carboxyl functionality and having ethylenic unsaturation and where the polyester and silane are combined to favor the acid-base salt reaction between the free carboxyl groups of the polyester resin and the amine group of the silane over the formation of silane dimers by combination of hydrolyzed silanes, and

an amount of water to produce an emulsion having a total solids content in the range of about 5 to about 20 weight percent.

---

## 4,370,440
## COMPOSITIONS COMPRISING CHLOROSULPHONATED POLYETHYLENE, CARBOXYLATED BUTADIENE-ACRYLONITRILE AND MAGNESIUM OXIDE USEFUL FOR LINERS OR MEMBRANES

**Herbert F. Schwarz, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada**

**Filed Oct. 8, 1980, Ser. No. 195,253**
**Claims priority, application Canada, Nov. 9, 1979, 339502**
**Int. Cl.³ C08L** *33/02;* **C08K** *3/22*
**U.S. Cl. 524—522** **4 Claims**

1. An improved liner or membrane composition characterized in that it comprises from about 90 to about 55 parts by weight of chlorosulphonated polyethylene and from about 10 to about 45 parts by weight of carboxylated butadiene-acrylonitrile polymer, for a total of 100 parts by weight of polymers, said chlorosulphonated polyethylene containing from about 38 to about 42 weight percent of chlorine and from about 0.9 to about 1.1 weight percent of sulphur and said carboxylated butadiene-acrylonitrile polymer being a solid polymer having a Mooney (ML 1+4 at 100° C.) of from about 45 to about 70 and containing from about 25 to about 30 weight percent of acrylonitrile and from about 5 to about 10 weight percent of an unsaturated carboxylic acid monomer, and said composition also contains, per 100 parts by weight of polymers, from about 3 to about 7 parts by weight of magnesium oxide.

---

## 4,370,441
## SILICONIZED POLYESTER THERMOSETTING COATING COMPOSITIONS

**Joseph E. Gaske, Mt. Prospect; Thomas H. Plaisance, Wilmette, and Kazys Sekmakas, Palatine, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.**

**Filed May 29, 1981, Ser. No. 268,633**
**Int. Cl.³ C08L** *67/02, 67/00, 83/06, 61/26*
**U.S. Cl. 524—539** **9 Claims**

1. An organic solvent solution coating composition adapted to deposit a thermosetting weather-resistant coating comprising three essential resin components, as follows:

1- an essentially nonfunctional organic solvent-soluble silicone resin reaction product of a highly branched, low molecular weight hydroxy functional polyester with an hydroxy or alkoxy-functional organic polysiloxane, said polysiloxane being present in an amount of from 8% to 20% of the weight of the three resin components, and said polyester and said polysiloxane being combined in approximately stoichiometric proportions;

2- a reactive organic solvent-soluble essentially linear high molecular weight hydroxy functional polyester, said hydroxy functionality being present in an amount to provide a thermoset film by reaction with aminoplast resin, said reactive polyester constituting the balance of the three resin components; and

3- from 3% to 15%, based on the weight of the three resin components, of a heterocyclic aminoplast resin for curing said reactive polyester, said components 1 and 2 being compatible in the solution and at least partially incompatible in a film as the solvent evaporates, so that components 2 and 3 can cure is a deposited film and adhere the coating to a metal substrate, and component 1 can concentrate at the surface to enhance the weather resistance which is obtained when a deposited coating is baked.

---

## 4,370,442
## FIRE RETARDANT COMPOSITIONS

**Glenn A. Pearson, 3709 S. George Mason Dr., Falls Church, Va. 22041**

**Filed Dec. 5, 1980, Ser. No. 214,017**
**Int. Cl.³ C08L** *61/20*
**U.S. Cl. 524—598** **13 Claims**

1. A resinous aqueous solution comprising the reaction product in about 100–200 parts of water of (a) about 75–100 parts of aldehyde, (b) about 30–50 parts of urea, (c) about 20–40 parts of melamine and (d) about 100–125 parts of phosphoric acid, the solution being a stable clear solution having a good shelf life and forming flexible, waterproof and nonburning films on substrates.

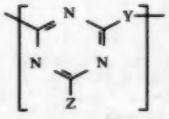
---

## 4,370,443
## NOVEL POLYMERIC COMPOUNDS, PROCESSES AND METHODS OF USE

**Eugene P. Wesseler, Sharonville, Ohio, assignor to Sterling Drug Inc., New York, N.Y.**

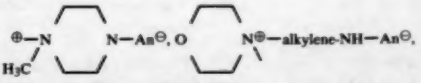
**Division of Ser. No. 254,501, Apr. 15, 1981, Pat. No. 4,347,352, which is a continuation-in-part of Ser. No. 126,995, Mar. 31, 1980, Pat. No. 4,314,001. This application Jan. 11, 1982, Ser. No. 338,789**
**Int. Cl.³ C08L** *79/04;* **D21H** *3/48, 3/80, 3/82*
**U.S. Cl. 524—612** **3 Claims**

1. A method of mordanting water-soluble dyestuffs on cellulosic fibers in the manufacture of paper which comprises treating said fibers in the form of an aqueous suspension with a water-soluble dyestuff and a water-soluble polymeric quaternary ammonium compound consisting essentially of repeating units of the formula



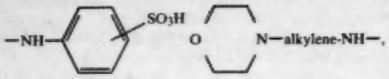
wherein:

Y represents a moiety selected from the group consisting of $-N^{\oplus}(CH_3)_2$-alkylene-NR— $An^{\ominus}$,



and $-N^{\oplus}(CH_3)_2$-alkylene-$N^{\oplus}(CH_3)_2$-$2An^{\ominus}$;

Z represents a moiety selected from the group consisting of $-N(R^1)$-alkylene$^1$-$N(R^2)_2$, $-N^{\oplus}(R^1)R^3An^{\ominus}$,



—NH-alkylene[1]-NR[4]-alkylene[1]-$NH_2$ in which alkylene and alkylene[1] are each selected from the group consisting of —$CH_2CH_2$—, —$CH_2CH_2CH_2$—, and —$CH_2CH_2CH_2CH_2$—; R, $R^1$, $R^2$, and $R^4$ are each selected from the group consisting of hydrogen, non-tertiary $C_1$ to $C_4$ hydroxyalkyl and non-tertiary $C_1$ to $C_4$ alkyl; $R^3$ is a non-tertiary $C_1$ to $C_{18}$ alkyl; and $An^{\ominus}$ is a monovalent anion.

---

**4,370,444**

## CONCENTRATED AQUEOUS SOLUTION OF PHENOL AND FORMALDEHYDE STABLE AT LOW TEMPERATURE PROCESS FOR PREPARING SAME

**Silvestro Pezzoli, Biassono, and Giancarlo Rossi, Monza, both of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy**

**Filed Jun. 11, 1981, Ser. No. 272,622**

**Claims priority, application Italy, Jun. 11, 1980, 22698 A/80**

**Int. Cl.[3] C08L 5/00**

**U.S. Cl. 524—732** **7 Claims**

1. An aqueous, fluid, storage-fluid solution of phenol, formaldehyde and a stabilizer, wherein: the molar ratio of the phenol to the formaldehyde is from 0.5:1 to 1.3:1; the water content does not exceed 30% by weight; the stabilizer comprises a carbohydrate or a mixture of carbohydrates in a proportion of from 1 to 10% by weight; the solution being free from purposely added acids and bases and its content of any genetic formic acid being not greater than 0.04% by weight.

---

**4,370,445**

## POLYURETHANE-BASE MATERIAL SUITABLE FOR USE FOR MAKING FIRE ARRESTING WALLS

**Norbert Depetris, Carry le Rouet, and Claude Bovis, Martigues, both of France, assignors to Chloe-Chimie, Paris, France**

**Filed Nov. 13, 1980, Ser. No. 206,347**

**Claims priority, application France, Jun. 7, 1979, 79 14522**

**Int. Cl.[3] C08G 18/32; C08L 75/12**

**U.S. Cl. 524—742** **11 Claims**

1. Composition for filling internal cavities in strong walls and doors having good resistance to mechanical stresses and to heat, consisting of 30 to 70 parts by weight of polyurethane resin forming components:

from 10 to 60 parts by weight of divided elemental sulphur, from 0 to 15 parts by weight of flame and heat retardants in the form of halogenated compounds selected from the group consisting of chlorinated paraffin, chlorinated diphenyls and dibromopropanol.

**4,370,446**

## METHOD FOR MANUFACTURE OF POLYBUTADIENE-MODIFIED UNSATURATED POLYESTER

**Tsutomu Toyoda; Iwao Maekawa; Hirobumi Izumi, and Tadashi Fuzii, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan**

**Filed Jun. 8, 1981, Ser. No. 271,698**

**Claims priority, application Japan, Jun. 12, 1980, 55-79654**

**Int. Cl.[3] C08G 63/76; C08L 67/04**

**U.S. Cl. 525—36** **25 Claims**

1. A method for the manufacture of a polybutadiene-modified unsaturated polyester, comprising the steps of:

(I) preparing a reaction product by reacting as component (A) an $\alpha,\beta$-unsaturated dicarboxylic acid or anhydride with as component (B) at least one compound selected from the group consisting of (i) air-drying allyl compounds, (ii) unsaturated animal and vegetable oils, the fatty acids thereof, and the transesters thereof with polyols, and (iii) a dicyclopentadiene or a hydroxylated cyclopentadiene at a (B)/(A) component molar ratio within the range of from 0.8 to 1.2, and

(II) thereafter reacting the resultant product with as component (C) at least one compound selected from the group consisting of $\alpha,\omega$-polybutadiene glycol and $\alpha,\omega$-hydrogenated polybutadiene glycol.

---

**4,370,447**

## UNSATURATED POLYESTER RESIN COMPOSITIONS

**Katuhiro Ishikawa; Ryotaro Ohno, and Masatoshi Arakawa, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan**

**PCT No. PCT/JP80/00163, § 371 Date Mar. 11, 1981, § 102(e) Date Mar. 11, 1981, PCT Pub. No. WO81/00258, PCT Pub. Date Feb. 5, 1981**

**PCT Filed Jul. 18, 1980, Ser. No. 253,832**

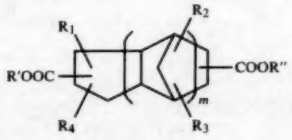
**Claims priority, application Japan, Jul. 19, 1979, 54-90957**

**Int. Cl.[3] C08G 63/76; C08L 67/00**

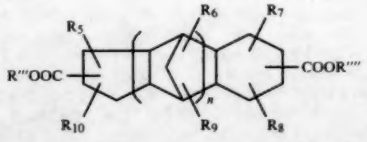
**U.S. Cl. 525—39** **21 Claims**

1. Unsaturated polyester resin compositions comprising (A) unsaturated polyesters prepared from unsaturated polybasic acid components, saturated polybasic acid components, and polyhydric alcohol components, and (B) $\alpha,\beta$-ethylenically unsaturated monomer components, which are characterized in that:

(I) all or part of said saturated polybasic acid components consist of at least one of saturated dibasic acids or esters thereof represented by the formula:



($R_1$ to $R_4$ are each hydrogen or alkyl, R′ and R″ are the same or different and each represent hydrogen or ester-exchangeable alkyl, and m is 1 or 2), or the formula:



($R_5$ to $R_{10}$ are each hydrogen or alkyl, R‴ and R⁗ are the

same or different and each represent hydrogen or ester-exchangeable alkyl, and n is zero or 1),

(2) all or part of said polyhydric alcohol components consist of at least one glycol selected from the group consisting of ethylene glycol, propylene glycol, neopentyl glycol, and bisphenol A derivatives, and

(3) all or part of said α,β-ethylenically unsaturated monomer components consist of an aromatic vinyl monomer.

---

**4,370,448**

## THERMOSETTING COMPOSITION COMBINED HIGH VINYL DIOLEFIN POLYMER WITH HIGH VINYL LOW VINYL DIOLEFIN POLYMER

**John E. Leland, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 24, 1981, Ser. No. 247,040**

**Int. Cl.³ C08L** *9/06, 9/00*

**U.S. Cl. 525—99** **9 Claims**

1. A thermosetting composition comprising:

(a) High vinyl diolefin polymer chosen from among the group consisting of (1) homopolymers of 1,3-butadiene having about 50 to about 90 percent 1,2 addition and (2) copolymers of about 50 to about 95 weight percent 1,3-butadiene having about 50 to about 90 percent 1,2 addition and about 50 to about 5 weight percent styrene and

(b) About 15 to about 35 weight percent of total polymer phase of a normally solid elastomeric 1,3-butadiene polymer consisting of segments of high vinyl having about 50 to about 90 percent 1,2 addition and low vinyl having about 5 to about 15 percent 1,2 addition in a weight ratio of high vinyl:low vinyl of about 60:40 to about 40:60.

---

**4,370,449**

## TRANSITION METAL COMPOSITION AND PRODUCTION THEREOF

**Ashley D. Bye, The Hague, Netherlands, assignor to Imperial Chemical Industries Limited, London, England**

**Division of Ser. No. 936,892, Aug. 25, 1978, Pat. No. 4,203,867.**

**This application Nov. 1, 1979, Ser. No. 90,119**

**Claims priority, application United Kingdom, Aug. 31, 1977, 36343/77; May 24, 1978, 21733/78**

**Int. Cl.³ C08F** *4/64, 10/00*

**U.S. Cl. 525—247** **12 Claims**

1. A process for the production of a polymer or copolymer of an olefine monomer wherein at least one olefine monomer, or a mixture of at least one olefine monomer and ethylene, is polymerised by contacting the at least one olefine, or mixture thereof with ethylene, under polymerisation conditions with an olefine polymerisation catalyst comprising

(1) a titanium trichloride-containing material; and

(2) at least one organo-metallic compound of aluminium, or of a non-transition metal of Group IIA of the Periodic Table, or a complex of an organo-metallic compound of a non-transition metal of Group IA or Group IIA of the Periodic Table with an organo-aluminium compound,

wherein the titanium trichloride-containing material which is component (1) of the catalyst is obtained by a process which consists essentially of

(1) reducing titanium tetrachloride by reacting the titanium tetrachloride with a reducing agent under conditions to give a solid titanium trichloride product which includes an associated aluminium compound containing aluminium and chlorine atoms, wherein the titanium trichloride is formed predominantly in the solid beta-form;

(2) contacting a suspension of the solid reduction product of step (1) with reagents consisting of compound E and compound L either simultaneously or sequentially, at least part of the contacting being effected while maintaining the suspension at a temperature of at least 60° C. in the presence of at least compound E or compound L; and

(3) subsequent to the contacting with the compound E washing the solid product obtained with an inert hydrocarbon or inert halohydrocarbon liquid

where

E is an ether or a thioether; and

L is an organic Lewis Base compound selected from esters of the formula

$$R^1R^2R^3CCOOR^1;$$

esters and partial esters of aliphatic diols and polyols; amines of the formula

$$R^4R^5R^6N;$$

and ketones of the formula

$$R^7—\overset{\overset{O}{\|}}{C}—R^8$$

where

$R^1$ is a hydrocarbyl group;

$R^2$ and $R^3$ are each, independently, a hydrogen atom or a hydrocarbyl group; or the group $R^1R^2R^3C—$ is a substituted or unsubstituted, saturated or unsaturated, condensed or uncondensed hydrocarbyl ring system;

$R^4$ and $R^5$ are hydrocarbyl groups;

$R^6$ is a hydrogen atom, a hydrocarbyl group or a group

$$—C_mH_{2m}NR^4R^5;$$

or $R^4$ and $R^5$, optionally together with $R^6$, together form a substituted or unsubstituted, saturated or unsaturated, condensed or uncondensed ring system;

$R^7$ is a hydrocarbyl group;

$R^8$ is a hydrocarbyl group, which may optionally be substituted with one hydrocarbonoxy group; and

m is 1, 2 or 3.

---

**4,370,450**

## PROCESS FOR THE PRODUCTION OF POLAR-MODIFIED POLYPROPYLENE AND ITS USE

**Ulrich Grigo, Krefeld; Josef Merten, Korschenbroich, and Rudolf Binsack, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed May 26, 1981, Ser. No. 266,949**

**Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021105**

**Int. Cl.³ C08F** *255/02*

**U.S. Cl. 525—262** **5 Claims**

1. A process which comprises the steps of

(1) preparing an aqueous suspension which, based on 100 to 2000 parts by weight of water, contains

(a) 100 parts by weight of particles of a polymer selected of the group consisting of crystalline homo-polypropylene and crystalline copolymers of copolymerized units of at least 70% by weight of propylene and another α-olefin,

(b) 4 to 30 parts by weight of a polar-vinyl monomer,

(c) based on 100 parts by weight of monomer, 0.1 to 10 parts by weight of a radical chain polymerization initiator which has a half-life of at least 2 h at a temperature of 80° to 135° C. and

(d) 10 to 1200 parts by weight of an organic solvent which is capable of swelling polypropylene, has a boiling point at 760 Torr of at least 100° C., is miscible with the monomer in any proportion and is an aromatic hydrocarbon, an aliphatic hydrocarbon, a halogenated aromatic hydrocarbon or a mixture thereof:

(2) heating the aqueous suspension without decomposition of the initiator of (c) to swell the polymer of (a) and permit

the monomer of (b) to penetrate into said polymer and then

(3) maintaining the aqueous suspension at a temperature of ≧85° C. until the polymerization of said monomer has ceased.

---

**4,370,451**

## NOVEL BLOCK COPOLYMERS INCLUDING ACRYLONITRILE SEQUENCES AND SEQUENCES INCLUDING UNITS DERIVED FROM GLUTARIMIDE UNITS AND PROCESSES FOR PREPARING SAME

**Vladimir A. Stoy, Princeton, N.J., assignor to S.K.Y. Polymers, Princeton, N.J.**

**Continuation-in-part of Ser. No. 166,032, Jul. 7, 1980, and a continuation-in-part of Ser. No. 188,060, Sep. 17, 1980, Pat. No. 4,337,327. This application Feb. 8, 1982, Ser. No. 346,417**

**Int. Cl.³ C08F** *220/48, 293/00*

**U.S. Cl. 525—294** **7 Claims**

1. A novel block copolymer of a molecular weight of from 10,000 to 2,000,000 comprised of acrylonitrile sequences and sequences comprised of at least about 50 mole percent acrylamide units and organo-substituted amide units derived from glutarimide units, said acrylonitrile sequences having a molecular weight of at least 400, said sequence of said acrylamide and said organo-substituted amide units having a molecular weight of at least 400.

---

**4,370,452**

## PROCESS TO INDUCE RAPID CURING OF A COPOLYESTER RESIN WITH EPOXIDE COMPOUNDS AND A COMPOSITION FORMED FOR THAT PROCESS

**Paul L. Heater, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Jan. 12, 1981, Ser. No. 223,972**

**Int. Cl.³ C08L** *63/00, 67/02*

**U.S. Cl. 525—438** **19 Claims**

1. A process to induce rapid curing of a copolyester resin, comprising:

reacting from about 0.001 to about 10.0 weight percent of a curing reaction catalyst with the copolyester resin during the polymerizaton of the copolyester resin, such that the copolyester resin has activated termini prior to compounding the copolyester resin with an epoxide compound, said activated termini permitted rapid curing of the copolyester resin after said compounding and during heating of the copolyester-epoxide mixture;

said polymerization comprises an esterification stage, a condensation stage, a reactor compounding stage, and finishing stage;

said reaction occurring during said reactor compounding stage; and

wherein said curing reaction catalyst is selected from compounds having the formulae, and combinations thereof:

$$N^+R_4X^-$$

where R, which may be the same of different, is selected from the group consisting of an alkyl radical having from 1 to 18 carbon atoms, a halo-substituted alkyl radical having from 1 to 18 carbon atoms, a hydroxy substituted alkyl radical having from 1 to 18 carbon atoms, an aryl radical having from 6 to 24 carbon atoms, and an aralkyl radical having from 7 to 24 carbon atoms, and combinations thereof; and where X is a halide radical selected from the group consisting of fluoride, chloride and bromide;

$$AR_t$$

where R is the same as that described above and may be the same or different; where A is selected from the group consisting of N, P, and Sn; and where t is 3 when A is N or P or is 4 when A is Sn; or

$$(R_3COO^-)_n(M)^{n+}$$

where n is a number from 1 to 3, where R is the same as that described above, where M is a metal cation selected from the group consisting of cations of metals in Groups I and II of the Periodic Table of the Elements, and Fe, Sn, and Co.

---

**4,370,453**

## PROCESS FOR PREPARING CATHODIC ELECTRODEPOSITABLE COATING COMPOSITION

**Hiroyoshi Omika, Yokohama; Hajime Hara, Fujisawa; Yutaka Otsuki, Yokohama; Yoshihiko Araki, Kawasaki, and Kazuho Aoyama, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan**

**Filed Apr. 20, 1981, Ser. No. 255,664**

**Claims priority, application Japan, Apr. 28, 1980, 55-55473**

**Int. Cl.³ C08L** *63/00;* **C09D** *3/58, 5/40*

**U.S. Cl. 525—450** **6 Claims**

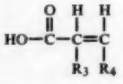
1. A process for preparing a cathodic electrodepositable coating composition which comprises, in sequence,

(i) epoxidizing a high-molecular-weight compound containing a carbon-carbon double bond and having a molecular weight of 500 to 10,000 and an iodine value of 100 to 500 to form an epoxidized high-molecular-weight compound containing 0.5 to 12% by weight of oxirane oxygen,

(ii) reacting a part of the epoxy groups of the epoxidizing high-molecular-weight compound with a basic amine compound of the general formula

wherein $R_1$ and $R_2$, independently from each other, represent a hydrocarbon group having 1 to 10 carbon atoms which may be partly replaced by a hydroxyl group, and $R_1$ and $R_2$ together may form a cyclic structure,

(iii) reacting a part or the whole of the remaining epoxy groups with an $\alpha,\beta$-unsaturated monocarboxylic acid of the general formula



wherein $R_3$ and $R_4$ represent a hydrogen atom or a methyl group, at least one of them being a hydrogen atom,

to prepare a resin composition, and

(iv) neutralizing the resin composition with an organic or inorganic acid to render it water-soluble or water-dispersible.

---

**4,370,454**

## PREPARATION OF MALEIC ANHYDRIDE COPOLYMERS

**Karlheinz Messmer, Ludwigshafen; Hermann Fischer; Heinrich Hartmann, both of Limburgerhof; Walter Denzinger, Speyer; Rolf Schneider, Mannheim; Klaus Wulz, Lambsheim, and Hans-Juergen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany**

**Filed Feb. 19, 1982, Ser. No. 350,356**

**Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108100**

**Int. Cl.³ C08L** *37/00*

**U.S. Cl. 526—88** **6 Claims**

1. A process for the preparation of a maleic anhydride copolymer powder by copolymerization, wherein a solution or

dispersion of maleic anhydride in a $C_1$–$C_8$-alkyl vinyl ether and/or a $C_3$–$C_{10}$-alkene, containing from 3 to 25 moles of the $C_1$–$C_8$-alkyl vinyl ether and/or $C_3$–$C_{10}$-alkene per mole of maleic anhydride, is brought into contact with a powder bed under polymerization conditions, and is polymerized in the bed whilst the reaction mass is circulated and the powder state is maintained, and the heat generated during polymerization is removed by evaporating excess monomer which boils lower than maleic anhydride.

---

## 4,370,455
## PROCESS FOR POLYMERIZING OR COPOLYMERIZING OLEFINS

**Takashi Ueda; Syuji Minami; Mamoru Kioka, all of Obtake, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan**

**Filed Dec. 10, 1979, Ser. No. 101,470**
**Claims priority, application Japan, Dec. 11, 1978, 53-151999**
**Int. Cl.³ C08F 4/02, 10/00**
**U.S. Cl. 526—125** **9 Claims**

1. In a process for producing a polymer or a copolymer of an alpha-olefin having 2 to 12 carbon atoms which comprises continuously polymerizing or copolymerizing said alpha-olefin or alpha-olefin with up to 5 mole % of a diolefin in the presence of a catalyst comprising a transition metal catalyst component and an organo-aluminum catalyst component; the improvement wherein:

[I] said polymerization or copolymerization is carried out in the presence of a catalyst composed of:

(A) a solid magnesium compound obtained by reacting (i) an adduct between a magnesium halide and an electron donor selected from the group consisting of an alcohol with 1 to 18 carbon atoms, an aldehyde with 2 to 15 carbon atoms, a carboxylic acid with 2 to 18 carbon atoms and an amine, with (ii) an organoaluminum compound having the following formula:

$$R^1_mAl(OR^2)_nH_pX_q$$

wherein $R^1$ and $R^2$ are identical or different and represent a hydrocarbon group having 1 to 5 carbon atoms, X represents halogen, m is a number in the range of $0<n\leqq3$, n is a number in the range of $0\leqq n<3$, p is a number in the range of $0\leqq p<3$, and q is a number in the range of $0\leqq q<3$ and $m+n+p+q=3$, or having the following formula:

$$M^1AlR^1_4$$

wherein $M^1$ represents Li, Na or K, and $R^1$ is the same as defined above,

(B) a liquid titanium or vanadium metal compound, and

(C) an organoaluminum compound, and

[II] said continuous polymerization or copolymerization is carried out while feeding compound (B) separately from other compounds (A) and (C) into a polymerization or copolymerization zone, components (A), (B), and (C) being fed continuously to said zone.

---

## 4,370,456
## CATALYST COMPOSITION FOR COPOLYMERIZING ETHYLENE

**Kathleen F. George, Crosslanes, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Nov. 23, 1981, Ser. No. 324,075**
**Int. Cl.³ C08F 4/02, 10/02**
**U.S. Cl. 526—125** **38 Claims**

1. A continuous process for producing ethylene copolymers containing at least 90 mol percent of ethylene and no more than 10 mol percent of one or more alpha olefins containing from 3 to 8 carbon atoms, said copolymers being produced in granular form and having a density of from 0.91 g/cm³ to 0.94 g/cm³,

which comprises contacting a mixture of ethylene and at least one alpha olefin containing from 3 to 8 carbon atoms, at a temperature of from 30° C. to 105° C. and a pressure no greater than 1000 psi, in a gas phase reaction zone, with particles of a catalyst system comprising a precursor composition having the formula

$$Mg_mTi(OR)_nX_p[ED]_q$$

wherein R is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms, or COR′ wherein R′ is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms,

X is selected from the group consisting of Cl, Br, I, and mixtures thereof,

ED is an organic electron donor compound selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers and aliphatic ketones,

m is 0.5 to 56,

n is 0, 1 or 2,

p is 2 to 116, and

q is 2 to 85,

said precursor composition being diluted with a silica support containing from 5 percent by weight to 15 percent by weight of a dialkylzinc compound having the formula

$$ZnR''R'''$$

wherein R″ and R‴ are alkyl radicals containing from 1 to 12 carbon atoms,

and said precursor composition being completely activated with an organoaluminum activator compound having the formula

$$Al(R'''')_dX'_eH_f$$

wherein X′ is Cl or OR‴″,

R‴″ and R‴″ are saturated hydrocarbon radicals containing from 1 to 14 carbon atoms,

e is 0 to 1.5,

f is 0 or 1, and

$d+e+f=3$,

said activator compound being employed in an amount such as to provide a total aluminum:titanium molar ratio in said reaction zone of from 10:1 to 400:1.

---

## 4,370,457
## CATALYST SYSTEM

**Nikolsous K. Balint, Du Page, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Continuation of Ser. No. 35,603, May 3, 1979, abandoned, which is a division of Ser. No. 881,828, Feb. 27, 1978, Pat. No. 4,171,284. This application Dec. 12, 1980, Ser. No. 215,676**
**Int. Cl.³ C08F 4/64, 10/06**
**U.S. Cl. 526—137** **7 Claims**

1. A polymerization process comprising contacting, under polymerization conditions, propylene or a mixture of propylene and one or more copolymerizable alpha-olefins with a catalyst comprising a titanium triahalide; a dialkyl aluminum halide; and an effective amount of a hexavalent sulfur mineral acid or anhydride selected from the group consisting of chlorosulfonic acid and sulfur trioxide in a molar ratio to titanium trihalide from about 0.005 to 1 to about 0.5 to 1, whereby the amount of n-hexane soluble polymeric product is decreased.

4,370,458

## PROCESS FOR THE MANUFACTURE OF POLYOLEFINS

Jürgen Falbe, Dinslaken; Peter Schneller, Oberhausen; Wolfgang Payer, Wesel; Ingrid Förster, Mulheim; Boy Cornils, Dinslaken; Hans-Walter Birnkraut, Oberhausen; Siegfried Lutze, Gelsenkirchen, and Karl Otterbein, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie AG, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 785,275, Apr. 6, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 954,021

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630262

Int. Cl.[3] C08F *4/64, 10/02*

U.S. Cl. 526—138 4 Claims

1. In a process for the polymerization of ethylene or a mixture of ethylene with an α-olefin with a $C_3$–$C_{15}$ α-olefin in solution, suspension or in the gas phase by contacting the ethylene or ethylene-α-olefin mixture at 20°–250° C. at 1 to 50 bar pressure with a mixed catalyst comprising a titanium (III) trichloride and an organoaluminum compound in the presence of hydrogen, the improvement which comprises employing as the organoaluminum compound 0.1 to 20 mols of triethylaluminum, triisobutylaluminum or isoprenylaluminum per mol titanium (III) trichloride and including in the reaction mixture oxygen at a concentration of 0.001 to 0.1 volume percent, based upon the volume of ethylene.

---

4,370,459

## POLYMERIZING UNSATURATED MONOMERS WITH GEM-DIPEROXYESTER CATALYST

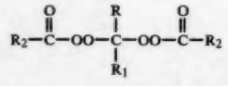
Ronald L. Pastorino, Larkspur; Lawrence A. Bock, Walnut Creek, and Reidar Halle, Novato, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,210

Int. Cl.[3] C08F *4/36, 14/06*

U.S. Cl. 526—227 10 Claims

1. In the polymerization of a monomer mass containing a monomer selected from vinyl chloride, ethylene, styrene, and methyl methacrylate and in the copolymerization of vinyl chloride and vinyl acetate by subjecting said monomers or comonomers to polymerization conditions in the presence of an initiating amount of organic peroxide, the improvement in which said organic peroxide has the formula:



where R is selected from methyl and ethyl; $R_1$ is ethyl when R is ethyl; $R_1$ is hydroxyalkyl of 1 to 7 carbon atoms when R is methyl; and each $R_2$ is

where each of $R_3$, $R_4$, and $R_5$ is selected from hydrogen and alkyl, provided not more than one of $R_3$, $R_4$, and $R_5$ is hydrogen, $R_3$, $R_4$, and $R_5$ collectively containing from 2 to 12 carbon atoms.

---

4,370,460

## COPOLYMERS BASED ON STYRENE AND ACRYLIC ACID ESTERS AND/OR METHACRYLIC ACID ESTERS, AND THEIR USE IN GASOLINE-CONTAINING MASONRY PAINTS OR RENDERS

Gerhard Neubert, Battenberg, and Eckehardt Wistuba, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinlein-Pfalz, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,195

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023326

Int. Cl.[3] C08F *220/12*

U.S. Cl. 526—329.2 1 Claim

1. A benzene-soluble copolymer, having a K value of from 15 to 60, which contains, as copolymerized units,

(A) from 10 to 40% by weight of styrene,

(B) from 10 to 50% by weight of tert-butyl acrylate and/or vinyl pivalate,

(C) from 20 to 40% by weight of isobutyl methacrylate,

(D) from 5 to 20% by weight of acrylic acid esters and/or methacrylic acid esters of alkanols of 10 to 20 carbon atoms and

(E) from 0 to 5% by weight of monoolefinically unsaturated monocarboxylic acids of 3 to 5 carbon atoms or their β-hydroxy ($C_{2-3}$) alkyl esters, and/or monoolefinically unsaturated dicarboxylic acids of 3–5 carbon atoms, their β-hydroxy ($C_{2-3}$) alkyl esters or mono-($C_{1-18}$) alkyl esters or mixtures of said monoolefinically unsaturated carboxylic acids or esters, the amount of component (D) being from 20 to 50% by weight of that of component (A), and the sum of the percentages of A to E being 100.

---

4,370,461

## ORGANO PHOSPHORUS-CONTAINING COMPOUNDS AS CATALYSTS FOR DEBLOCKING BLOCKED ISOCYANATES

Bruce L. Burton, Lake Jackson, Tex., and George A. Doorakian, Bedford, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 27, 1981, Ser. No. 286,925

Int. Cl.[3] C08G *18/14, 18/80*

U.S. Cl. 528—45 19 Claims

1. A process for deblocking blocked isocyanates which process comprises heating a composition containing a blocked isocyanate in the presence of, as a deblocking catalyst, an organo phosphorus-containing compound selected from phosphonium compounds and phosphines at a temperature and time for said deblocking to occur.

---

4,370,462

## CURABLE RESIN COMPOSITION

Nobuyuki Ikeguchi, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 6, 1979, Ser. No. 91,815

Claims priority, application Japan, Nov. 13, 1978, 53-139721

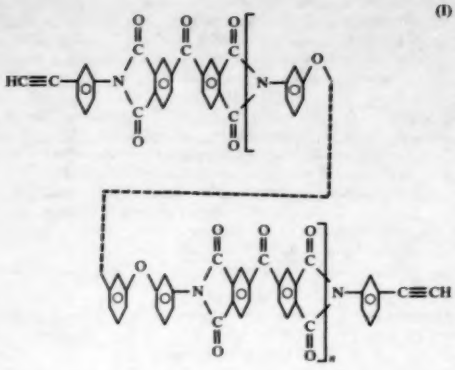
Int. Cl.[3] C08G *18/28*

U.S. Cl. 528—73 4 Claims

1. A curable resin composition comprising

(A) 80 to 99 parts by weight of a polyfunctional aromatic cyanate ester monomer, an aromatic cyanate ester homoprepolymer, or a coprepolymer of an aromatic cyanate ester and an amine of the formula $R^2$-(-$NH_2$)n wherein $R^2$ is a polyvalent aromatic or alicyclic organic group, and n is an integer of from 2 to 5, and

(B) 20 to 1 parts by weight of a compound of the formula (I)



(I)

wherein n is an integer of from 1 to 5.

---

**4,370,463**

## PROCESS FOR NO-BAKE FOUNDRY APPLICATION UTILIZING POLYURETHANES BASED ON AMINE POLYOLS

**Robert J. Schafer, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.**

**Continuation of Ser. No. 72,730, Sep. 4, 1979, abandoned, which is a continuation of Ser. No. 915,413, Jun. 14, 1978, abandoned. This application Mar. 30, 1981, Ser. No. 248,165**

**Int. Cl.³ C08G *18/50*; B22C *1/22***

**U.S. Cl. 528—78** **27 Claims**

1. Process for casting lightweight metals comprising:

(a) Forming a foundry mix said mix comprising an aggregate, a polyisocyanate and an amine polyol wherein the aggregate comprises at least 90% by weight of said mix;

(b) Shaping said mix to form a foundry shape;

(c) Allowing said mix to cure after said shape has been formed;

(d) Forming a shaped lightweight metal casting by using said cured shaped mix and by casting melted light weight metal into contact with said cured shaped mix; and

(e) Removing the cured shaped mix from said light weight metal casting;

---

**4,370,464**

## CATIONIC POLYMER FLOCCULANT

**Katsutoshi Tanaka, Chigasaki; Hisao Takeda, Zama; Mutsumi Kawano, Chigasaki, and Isao Miyahara, Samukawa, all of Japan, assignors to Kyoritsu Yuki Co., Ltd. and Mitsubishi Chemical Industries, Ltd., both of Tokyo, Japan**

**Filed Oct. 28, 1981, Ser. No. 315,930**

**Claims priority, application Japan, Jun. 9, 1981, 56-88731**

**Int. Cl.³ C08G *65/26***

**U.S. Cl. 528—99** **11 Claims**

1. A cationic polymer flocculant comprising a polycondensate of (i) epihalohydrine and (ii) a mixture of component (a) and component (b) at a molar ratio of (a)/(b) in the range of 90/10 to 50/50 wherein said component (a) is a reaction product of monohydric phenol with formaldehyde and dialkylamine of two to six carbon atoms, and said component (b) is a reaction product of bisphenol with formaldehyde and dialkylamine of two to six carbon atoms.

**4,370,465**

## EPOXY RESINS HAVING IMPROVED PHYSICAL PROPERTIES WHEN CURED

**Ross C. Whiteside, Jr., Angleton; Adolphus V. Gist, Lake Jackson, both of Tex., and George A. Doorakian, Bedford, Mass., assignors to The Dow Chemical Co., Midland, Mich.**

**Division of Ser. No. 212,959, Dec. 4, 1980, Pat. No. 4,352,918. This application Dec. 14, 1981, Ser. No. 330,047**

**Int. Cl.³ C08G *59/62*, *59/68*, *59/50***

**U.S. Cl. 528—104** **35 Claims**

1. A product resulting from curing a mixture of

(1) an epoxy resin prepared by reacting

(A) an epoxy resin which is a glycidyl ether of a dihydric phenol having an average of more than one glycidyl ether group per molecule with

(B) a dihydric phenolic compound in the presence of

(C) a phosphonium catalyst employing components (A) and (B) in quantities such that the phenolic hydroxyl to epoxide equivalent ratio is that which will provide a theoretical percent epoxide of the resultant reaction product of from about 2.7 to about 14;

wherein the catalyst, component (C), is employed in a quantity such that the epoxy resin which would result when subjecting a mixture of components (A), (B) and (C) to suitable reaction conditions produces an advanced epoxy resin wherein the difference obtained by subtracting the percent epoxide obtained by analysis from the theoretical percent epoxide is from about 0.5 to about 4; and

(2) a curing quantity of a curing agent therefor.

---

**4,370,466**

## OPTICALLY ANISOTROPIC MELT FORMING POLYESTERS

**Roger K. Siemionko, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 28, 1981, Ser. No. 306,592**

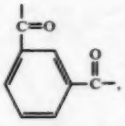
**Int. Cl.³ C08G *63/60***

**U.S. Cl. 528—190** **8 Claims**

1. Fiber-forming melt-spinnable copolyesters that exhibit optical anisotropy in the melt consisting essentially of Units I, II, III and IV having the structural formulas:

I

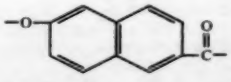
II



III

and

IV



wherein said polyesters comprise at least about 10 mole % of Unit I, at least about 10 mole % of Unit II, from about 40 to 70 mole % of Unit III and from about 2.5 to 15 mole % of Unit

IV, the number of dioxy units in the polyester being substantially equal to the number of dicarbonyl units.

---

**4,370,467**

**CURABLE RESIN COMPOSITION FROM POLYFUNCTIONAL AROMATIC ESTER AND MALEIMIDE COMPOUND**

**Morio Gaku, Showamachi, and Nobuyuki Ikeguchi, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Filed Jul. 3, 1980, Ser. No. 165,560**
**Claims priority, application Japan, Jul. 9, 1979, 54/86743**
**Int. Cl.³ C08G** *73/12, 83/00*
**U.S. Cl. 528—322** **9 Claims**

1. A curable resin composition comprising:
(i) catalytic components comprising at least one peroxide and at least one other catalytic component, and
(ii) a resin component consisting essentially of:
(a) at least one compound selected from the group consisting of:
(1) a polyfunctional aromatic cyanate ester monomer represented by the formula

$$R\text{-}(\text{-O—C}{\equiv}\text{N})_m$$

wherein m is an integer of 2 to 10 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,
(2) a homoprepolymer of one or more cyanate esters of (1), and
(3) a coprepolymer of (1) and an amine; and
(b) at least one component selected from the group consisting of:
(1) a polyfunctional maleimide,
(2) a homoprepolymer of one or more maleimides of (1), and
(3) a coprepolymer of (1) and an amine,
said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product.

---

**4,370,468**

**BIAXIALLY DRAWN POLYHEXAMETHYLENE ADIPAMIDE FILM**

**Osamu Nakajima, Moriyama; Yukinori Matsuoka, Shiga, and Yoshiaki Nakayama, Moriyama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan**

**Filed Nov. 5, 1980, Ser. No. 204,276**
**Claims priority, application Japan, Nov. 13, 1979, 54-146033**
**Int. Cl.³ C08G** *69/46*
**U.S. Cl. 528—335** **2 Claims**

1. A biaxially drawn film composed substantially of polyhexamethylene adipamide, said film having a refractive index of at least 1.560 in both the longitudinal direction and the transverse direction and an ultraviolet absorbance $E_{268}$ of not more than 0.4, as measured at a wavelength of 268 mμ on a film solution in formic acid, and wherein said film exhibits a shrinkage factor of not more than 5% in both the longitudinal direction and the transverse direction, as measured after dipping in hot water at 135° C. for 10 minutes.

---

**4,370,469**

**POLYPHENYLENESULFIDE SHEET-LIKE MATERIAL**

**Yukichi Deguchi, Ohtsu; Yukio Noguchi, Shiga, and Hiroaki Kobayashi, Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Mar. 10, 1981, Ser. No. 242,306**
**Int. Cl.³ C08G** *75/14*
**U.S. Cl. 528—388** **11 Claims**

1. A sheet-like material comprising a composition mainly consisting of high molecular weight poly p-phenylenesulfide, characterized in that:
a. the amount of ingredient which is extracted through chloroform extraction of said sheet-like material is less than 1.5 wt% of the entire weight of said sheet-like material prior to said extraction, and
b.
(i) the index of crystallinity of said poly-p-phenylenesulfide is in the range of about 2.5 and below 8.0,
(ii) the crystallite size of said poly p-phenylenesulfide is in the range of about 50 Å and below 100 Å, and
(iii) the orientation factors of said poly p-phenylenesulfide, measured in three directions comprising through the sample, edgewise and endwise, are above 0.70, as measured by wide angle X-ray diffraction.

---

**4,370,470**

**MULTISTAGE, AGITATED CONTACTOR AND ITS USE IN CONTINUOUS PRODUCTION OF ARYLENE SULFIDE POLYMER**

**Fernando C. Vidaurri, Borger, Tex., and Kenneth L. Anderson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Apr. 16, 1981, Ser. No. 254,679**
**Int. Cl.³ C08G** *75/14*
**U.S. Cl. 528—388** **14 Claims**

1. A method for continuous preparation of arylene sulfide polymer comprising
(1) introducing a polyhalo-substituted aromatic compound and a compound chosen from among the group consisting of (i) sulfur-containing complex produced from a suitable sulfur source, alkali metal hydroxide, at least one organic amide and, optionally, at least one polymerization modifying compound and (ii) suitable sulfur source, alkali metal hydroxide, a least one organic amide and, optionally, at least one polymerization modifying compound into at least a first chamber in a contacting apparatus comprising (A) a cyclindrical, vertically elongated shell having closed ends and separated by horizontal baffle plates into a multiplicity of discrete chambers with access from one chamber to another through concentric circular openings, axially centered in said baffles and (B) a continuous rotatable shaft extending concentric with said baffles within said shell with at least one agitator means attached thereto positioned in each chamber, said shaft and said circular openings providing annular openings such that the ratio of backflow rate to feed rate through the openings is less than 1.5:1.
(2) passing said reaction mixture through chambers of said contactor while maintaining each chamber within conditions for producing arylene sulfide polymers; and
(3) recovering arylene sulfide polymer from a chamber of the contactor removed from the chamber in which the initial reactants were introduced.

---

**4,370,471**

**HEAT CURING ARYLENE SULFIDE POLYMER**

**Emigdio J. Salmon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed May 6, 1981, Ser. No. 260,960**
**Int. Cl.³ C08G** *75/14*
**U.S. Cl. 528—388** **6 Claims**

1. A method for curing particulate arylene sulfide polymer comprising:
(a) preheating said particulate polymer from ambient temperature to a skin temperature within a range of about 230° to about 260° C. utilizing the frictional heat developed by the agitation of the particulate polymer in a polisher apparatus,
(b) transferring said preheated particles to a curing vessel, and
(c) further heating said preheated particulate polymers for a

time and at a bed temperature to produce cured polymer having a pre-selected melt flow range lower than the melt flow range of the polymer prior to curing.

---

**4,370,472**

## PLASMA EXPANDER

**Toshiji Igarashi, Tokorozawa; Keiichi Nomura, Hohya; Kunji Naito, and Mikihiko Yoshida, both of Okayama, all of Japan, assignors to Hayashibara Biochemical Laboratories, Inc., Okayama, Japan**

**Filed May 21, 1980, Ser. No. 152,151**

**Claims priority, application Japan, May 25, 1979, 54-63976**

**Int. Cl.³ A61K *31/715*; C07H *1/08***

**U.S. Cl. 536—1.1** **3 Claims**

1. A sterile, isotonic solution containing 4 to 10% w/v of a refined pullulan having a molecular weight distribution within the range of from 30,000 to 90,000.

---

**4,370,473**

## METHOD OF EXTRACTING FRUIT AND VEGETABLE PRESSINGS AND VEGETATION RAW MATERIALS

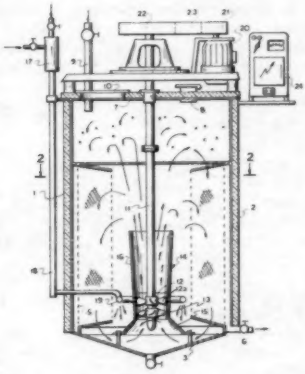
**Kiril S. Marev; Hristo G. Krachanov; Anton A. Bratanov, and Nikolay A. Kirchev, all of Plovdiv, Bulgaria, assignors to Vi po Hranitelna I Vkussova Promishlenost, Plovdiv, Bulgaria**

**Filed Aug. 15, 1980, Ser. No. 178,577**

**Claims priority, application Bulgaria, Aug. 16, 1979, 46895**

**Int. Cl.³ C08B *37/06***

**U.S. Cl. 536—2** **2 Claims**



1. A method for the extraction of a mass of fruit or vegetable pressings, or plant raw materials in a closed system by simultaneous mechanical and hydrodynamic effects on the materials, comprising subjecting the mass to a plurality of extractions in two cyclically alternating modes of fountain and turbulent agitation of different intensities by a rotary agitator having blades driven at blade tip speeds in an over-all range of from 3 to 25 m/sec.

---

**4,370,474**

## 11-DEOXY-CARMINOMYCIN COMPOUNDS

**Giuseppe Cassinelli, Pavia; Arpad Grein, Milan; Sergio Merli, Milan, and Giovanni Rivola, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy**

**Filed Nov. 15, 1979, Ser. No. 94,671**

**Claims priority, application United Kingdom, Nov. 21, 1978, 45434/78**

**The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.**

**Int. Cl.³ A61K *31/65, 31/71*; C12P *19/56, 29/00***

**U.S. Cl. 536—6.4** **4 Claims**

1. An antibiotic compound selected from the group consisting of 11-deoxy-14-hydroxy-carminomycin and the aglycone thereof.

---

**4,370,475**

## APRAMYCIN DERIVATIVES

**Kikuo Igarashi, Itami; Tsunetoshi Honma, Ikoma, and Tamio Sugawara, Mino, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

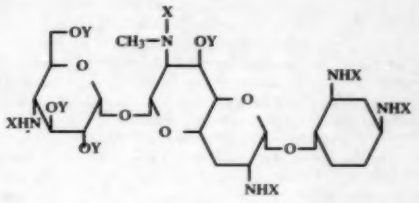
**Filed Oct. 22, 1981, Ser. No. 313,969**

**Claims priority, application Japan, Oct. 24, 1980, 55-149820**

**Int. Cl.³ A61K *31/71*; C07H *15/22***

**U.S. Cl. 536—16.8** **4 Claims**

1. An apramycin derivative of the formula



wherein X represents hydrogen or an amino protecting group selected from the group consisting of $C_2$–$C_5$ alkanoyl, $C_2$–$C_6$ alkoxycarbonyl, $C_7$–$C_{10}$ aroyl, $C_6$–$C_{10}$ aryloxycarbonyl, $C_7$–$C_{12}$ aralkoxycarbonyl, m-nitrophenylthio, and triphenylthio; Y represents hydrogen or a hydroxy protecting group selected from the group consisting of formyl, acetyl, benzoyl, benzyl, and tetrahydropyranyl; and the broken line represents the presence or absence of a double bond,

or a pharmaceutically acceptable acid addition salt thereof.

---

**4,370,476**

## DEXTRAN POLYCARBOXYLIC ACIDS, FERRIC HYDROXIDE COMPLEXES

**Thomas C. Usher, P.O. Box N7525, Nassau, The Bahamas, and Izu Hattori, 4 Box Hill Dr., West Hill, Ontario, Canada**

**Continuation-in-part of Ser. No. 58,151, Jul. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 764,194, Jan. 31, 1977, abandoned. This application Oct. 23, 1980, Ser. No. 200,031**

**Int. Cl.³ C08B *37/02***

**U.S. Cl. 536—113** **2 Claims**

1. A complex of ferric hydroxide with a dextran carboxylic acid derivative having a mean molecular weight range between about 1000 and 9000 and an intrinsic viscosity of between 0.028–0.085, and in which a plurality of pairs of carboxylic acid groups are distributed upon intermediate glycosyl units of the dextran polymer.

---

**4,370,477**

## CERTAIN 2-(ARYLALIPHATIC THIO)-PYRIDINIUM COMPOUNDS

**Roger Crossley, Reading, England, assignor to John Wyeth and Brother Limited, Maidenhead, England**

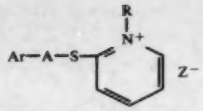
**Division of Ser. No. 170,366, Jul. 21, 1980, Pat. No. 4,304,781, which is a continuation-in-part of Ser. No. 98,420, Nov. 29, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 286,831**

**Claims priority, application United Kingdom, Nov. 30, 1978, 46722/78**

**Int. Cl.³ C07D *213/02***

**U.S. Cl. 542—413** **10 Claims**

1. A compound of the formula:



wherein Ar is phenyl substituted by one or more of the following: hydroxyloweralkyl, lower alkoxyloweralkyl, amino, loweralkylamino, diloweralkylamino, trifluoromethyl, loweralkyl, phenyl, aryllowerakyl or 7 to 12 carbon atoms, benzyloxy or disubstituted by a lower alkylenedioxy radical, A is saturated or unsaturated loweralkylene of 1 to 6 carbon atoms, which may be substituted by loweralkyl, phenyl, oxo or hydroxy, S is sulphur, R is loweralkyl of 1 to 4 carbon atoms or aralkyl of 7 to 10 carbon atoms, and $Z^-$ is a pharmaceutically acceptable anion.

---

**4,370,478**

## OXACEPHALOSPORINS

**Daniel Farge, Val de Marne; Pierre L. Roy, Thiais; Claude Moutonnier, Le Plessis Robinson; Bernard Plau, Creteil, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France**

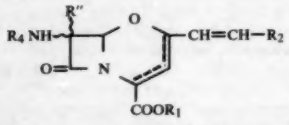
**Filed Nov. 19, 1981, Ser. No. 323,112**

**Claims priority, application France, Nov. 20, 1980, 80 24639**

**Int. Cl.³ C07D *498/04***

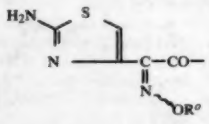
**U.S. Cl. 542—427** **9 Claims**

1. An oxacephalosporin of the formula:

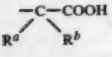


which is in the form of a bicyclooct-2-ene or bicyclooct-3-ene and of which the substituent in the 3-position exhibits E/Z stereoisomerism, and in which

(a) the symbol $R_1$ represents a hydrogen atom or an acid-protecting radical, the symbol $R_4$ represents a hydrogen atom or a radical of the general formula:



of which the amine group is free or protected and in which $R^o$ represents a hydrogen atom, an oxime-protecting radical, an alkyl or vinyl radical or a free or protected carboxyalkyl radical of the formula:



in which the radicals $R^a$ and $R^b$, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms, or $R_4$ represents an α-carboxyarylacetyl radical of which the carboxyl group is free or protected and in which aryl represents phenyl unsubstituted or substituted by a free or protected p-hydroxy radical, thien-2-yl, or thien-3-yl, and the symbol R″ represents a hydrogen atom or a methoxy radical in the 7α-position, or alternatively

(b) the symbol $R_1$ represents an acid-protecting radical which can easily be removed, the symbol $R_4$ represents an amine-protecting radical and the symbol R″ represents a hydrogen atom or a methoxy radical in the 7α-position or a hydrogen atom in the 7β-position, and the symbol $R_2$ represents a radical of the formula:

or



in which formulae $R_3$ is a linear or branched alkyl radical of 1 to 4 carbon atoms, trifluoromethyl, trichloromethyl, or phenyl which is unsubstituted or substituted by a halogen atom or by an alkyl or nitro radical, and $R'_3$ is defined in the same way as $R_3$ or represents an acylmethyl, 2-acylethyl, 2-acylpropyl, alkoxycarbonylmethyl, 2-alkoxycarbonylethyl or 2-alkoxycarbonylpropyl radical or $R_2$ is a halogen atom, it being understood that, unless otherwise mentioned, the above-mentioned alkyl or acyl radicals and portions are linear or branched and contain 1 to 4 carbon atoms, in its E or Z forms and mixtures thereof, and, if appropriate, in its syn or anti forms and mixtures thereof.

---

**4,370,479**

## HERBICIDAL SULFONAMIDES

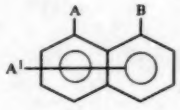
**George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 98,724, Nov. 30, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 184,371**

**Int. Cl.³ C07D *233/54;* A01N *43/50***

**U.S. Cl. 544—278** **24 Claims**

1. A compound of the formula

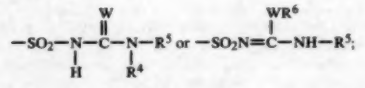


wherein

$A^1$ is H, F, Cl, Br, $CH_3O$ or $NO_2$;

A is Cl, F, Br, $NO_2$, $CH_3$, $-SO_2NR^1R^2$, $-SO_2N(CH_3)(OCH_3)$, $-S(O)_nR^3$, $-OR^3$, $-OSO_2R^3$ or $OSO_2CF_3$;

B is



n is 0, 1 or 2;

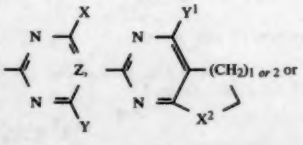
$R^1$ is $C_1$–$C_4$ alkyl;

$R^2$ is $C_1$–$C_4$ alkyl;

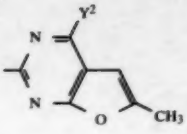
$R^3$ is $C_1$–$C_4$ alkyl;

$R^4$ is H or $CH_3$;

$R^5$ is



-continued



$R^6$ is $C_1$–$C_6$ alkyl;
$R^{10}$ is H or $CH_3$;
$R^{11}$ is $C_1$–$C_3$ alkyl;
$R^{12}$ is $C_1$–$C_3$ alkyl or $C_3$–$C_6$ alkenyl;
T is O or N-$OR^{12}$;
W is O or S;
X is $CH_3$, $CH_3O$ or $CH_3CH_2O$;
$X^2$ is O or $CH_2$;
Y is H, $C_1$–$C_3$ alkyl, $CH_3OCH_2$, $CH_3CH_2OCH_2$, $OCH_2CO_2$—(H or $C_1$–$C_2$ alkyl), $OCH(CH_3)CO_2$(H or $C_1$–$C_2$ alkyl), O—($C_1$–$C_3$ alkyl), O—($C_3$–$C_4$ alkenyl) or $NR^{10}R^{11}$;
$Y^1$ is H, $CH_3$ or $OCH_3$;
$Y^2$ is H or $CH_3$; and
Z is N;
and their agriculturally suitable salts.

---

**4,370,480**

## HERBICIDAL UREAS AND ISOUREAS

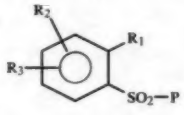
**George Levitt, Wilmington, and Wallace C. Petersen, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 168,891, Jul. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 98,776, Nov. 30, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 212,869**

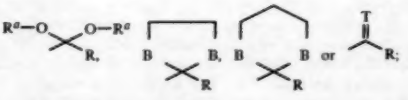
**Int. Cl.**[3] **C07D** *239/24;* **A01N** *43/54*

**U.S. Cl. 544—320** **15 Claims**

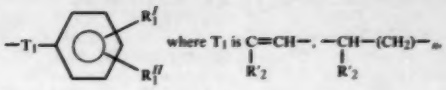
1. A compound of the formula:



where
$R_1$ is

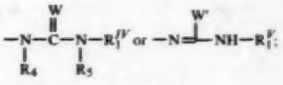


B=O or S(O)$_G$;
G=O or 2;
$R^a$ is $CH_3$ or $CH_3CH_2$;
R=H; $C_1$–$C_{12}$ alkyl; $C_2$–$C_6$ alkenyl; $C_2$–$C_6$ alkynyl; $C_1$–$C_4$ alkyl substituted with one to four substituents selected from 0–3 F, 0–3 Cl, 0–3 Br, 0–2 $OCH_3$, 0–1 cyano, 0–1 $CO_2R_1'$ where $R_1'$ is $C_1$–$C_3$ alkyl; $CO_2R_1'$; $C_2$–$C_4$ alkenyl substituted with 1–3 Cl; $C_3$–$C_6$ cycloalkyl; $C_5$–$C_6$ cycloalkenyl; $C_5$–$C_6$ cycloalkyl substituted with substituents selected from 1–3 $CH_3$ or one of $CH_3CH_2$, Cl, $OCH_3$; $C_4$–$C_7$ cycloalkylalkyl;

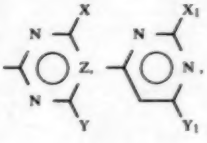


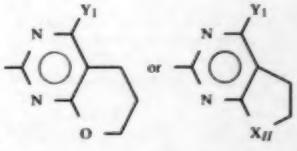
or a single bond;
where
$R_2'$ is H or $CH_3$, n is 0 or 1;
$R_1^I$ and $R_1^{II}$ are independently H, $CH_3$, Cl or $OCH_3$;
T=O or

where $R_1^{III}$ is H, $C_1$–$C_4$ alkyl or $C_3$–$C_4$ alkenyl;
$R_2$=H, F, Cl, Br, $C_1$–$C_3$ alkyl, $NO_2$, $SO_2CH_3$, $OCH_3$, $SCH_3$, $CF_3$ or $N(CH_3)_2$;
$R_3$=H, F, Cl, Br or $CH_3$;
P=

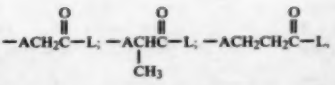


where
$R_4$=H or $CH_3$;
$R_5$=H, $CH_3$ or $OCH_3$;
W=O or S;
$R_1^{IV}$=



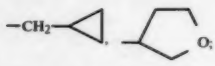


where
Z=CH;
X=H, Cl, —$CH_3$, —$OCH_3$, —$OCH_2CH_3$ or —$OCH_2CH_2OCH_3$;
Y=H; Cl; $C_1$–$C_4$ alkyl; $C_1$–$C_4$ alkyl substituted with —$OCH_3$, —$OC_2H_5$, —CN, —$CO_2CH_3$, —$CO_2C_2H_5$ or 1–3 atoms of F, Cl, Br; $C_3$–$C_4$ alkenyl; —$CH_2C{=}CR_6$ where $R_6$ is H, —$CH_3$, —$CH_2$Cl; —A—$(CH_2)_{n'}$—$A_1$—($C_1$–$C_3$ alkyl) where n' is 2 or 3, A is O or S and $A_1$ is O, S or $SO_2$;



where L is OH, —$NH_2$, —$NHCH_3$, —$N(CH_3)_2$

—NH($C_1$–$C_4$ alkyl), —N($C_1$–$C_4$ alkyl)$_2$, $C_1$–$C_6$ alkoxy; SCN; —$N_3$; $NR_7R_8$ where $R_7$ is H or $CH_3$ and $R_8$ is H, —$OCH_3$, $C_1$–$C_4$ alkyl, $C_3$–$C_6$ cycloalkyl, $C_1$–$C_4$ alkyl substituted with —CN or —$CO_2CH_3$ or $CO_2C_2H_5$, $C_3$–$C_4$ alkenyl or $C_2$–$C_3$ alkyl substituted with $OCH_3$ or $OC_2H_5$, or $R_7$ and $R_8$ can be taken together to form —$CH_2CH_2CH_2CH_2$— or —$CH_2CH_2OCH_2CH_2$—; —O—$R_9$ where $R_9$ is $C_1$–$C_4$ alkyl, $C_2$–$C_4$ alkyl substituted with 1–3 atoms of F, Cl or Br, $C_1$–$C_4$ alkyl substituted with cyano, $C_3$–$C_4$ alkenyl, —$CH_2C{=}CR_6$, where $R_6$ is as previously defined,



—$SR_{10}$ where $R_{10}$ is $C_1$–$C_4$ alkyl, $C_1$–$C_2$ alkyl substituted with CN, allyl or propargyl;

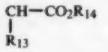
$X_1$=H, Cl, $OCH_3$, $OCH_2CH_3$ or $CH_3$;

$Y_1$=H, $OCH_3$ or $CH_3$;

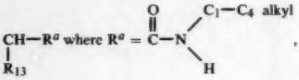
$X_{II}$=O or $CH_2$;

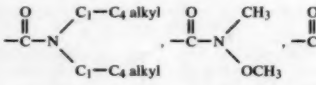
$X_1^I$ and $Y_1^I$=$CH_3$ or $OCH_3$;

W'=$SR_{11}$ or $OR_{12}$; where $R_{11}$ and $R_{12}$=$C_1$–$C_{12}$ alkyl; $C_3$–$C_4$ alkenyl; $CH_2CH_2OCH_3$; $CH_2CH_2OCH_2CH_3$; $CH_2CH_2CH_2OCH_3$; benzyl;



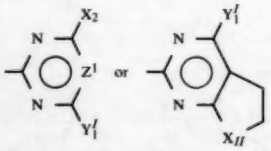
where $R_{13}$ is H or $CH_3$, $R_{14}$ is $C_1$–$C_4$ alkyl; $R_{11}$ also=





CN, $C_2$–$C_4$ alkenyl, $C_2$–$C_4$ alkynyl, phenyl and phenyl substituted with $CH_3$ or Cl;

$R_1^V$=



where

$Z^I$=CH;

$Y_1^I$=$CH_3$ or $OCH_3$;

$X_2$=$CH_3$; $C_1$–$C_4$ alkoxy; $O(CH_2)_{n''}OR_{15}$ where n'' is 1–3, $R_{15}$ is $C_1$–$C_3$ alkyl; $OCHR_{16}CO_2R_{17}$ where $R_{16}$ is H or $CH_3$; $OCH_2CF_3$ or $OCH_2CCl_3$; $R_{17}$ is $C_1$–$C_3$ alkyl; and

$X_{II}$=O or $CH_2$;

with the provisos that:

(1) when Y contains ≧4 carbon atoms, R contains ≦4 carbon atoms;

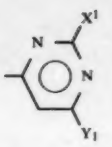
(2) when X is Cl, then Y is Cl;

(3) when X and Y are both H, then R is ≦4 carbon atoms;

(4) when Z≠N or CH, then X=H, $CH_3$, $OCH_3$ or Cl and Y=H, $CH_3$ or $OCH_3$;

(5) both $X_1$ and $Y_1$ cannot be H; and

(6) when $R_1^{IV}$ is



then $R_4$ and $R_5$ are hydrogen and R≦5 carbon atoms;

(7) when T is =N—$OR_1^{III}$, then R contains ≦5 carbon atoms;

and their agriculturally suitable salts.

---

**4,370,481**

## PROCESS FOR THE PRODUCTION OF 3-PICOLINE

**Rolf Dinkel, Münchenstein, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland**

**Filed Mar. 12, 1982, Ser. No. 357,626**

**Claims priority, application Switzerland, Mar. 18, 1981, 1836/81**

**Int. Cl.**[3] **C07D** *213/08, 213/10*

**U.S. Cl. 546—251** **6 Claims**

1. Process for the production of 3-picoline characterized in that a first educt consisting of acetaldehyde and/or at least one acetaldehydeacetal and/or crotonaldehyde is reacted with a second educt consisting of formaldehyde and/or at least one formaldehydeacetal and/or hexamethylenetetramine in a liquid, aqueous phase at a temperature of 180° to 280° C. in a closed vessel in the presence of an amide of a carboxylic acid.

---

**4,370,482**

## SYNTHESIS OF TETRAMISOLE, LEVAMISOLE AND THEIR DERIVATIVES

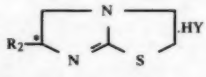
**Sivaraman Raghu, Norwalk; Arthur K. Hoffmann, New Canaan, and Balwant Singh, Stamford, all of Conn., assignors to American Cyanamid Co., Stamford, Conn.**

**Division of Ser. No. 878,049, Feb. 15, 1978, Pat. No. 4,314,066, which is a division of Ser. No. 739,923, Nov. 8, 1976, Pat. No. 4,087,611, which is a continuation-in-part of Ser. No. 680,302, Apr. 26, 1976, abandoned. This application Oct. 28, 1981, Ser. No. 315,788**

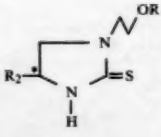
**Int. Cl.**[3] **C07D** *513/04*

**U.S. Cl. 548—155** **6 Claims**

1. A method for the preparation of an optically active compound of the formula:



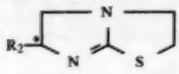
wherein $R_2$ is selected from the group consisting of phenyl and phenyl substituted with up to two groups selected from the group consisting of halo, $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy and trifluoromethylphenyl, and Y is selected from the group consisting of a pharmaceutically acceptable anion, which comprises heating a substituted optically active imidazolidinethione of the formula:



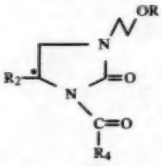
wherein $R_2$ is as previously defined and R is selected from the

group consisting of $C_1$–$C_6$ alkyl, halo $C_1$–$C_6$ alkyl, phenyl, $C_1$–$C_6$ alkylphenyl, $C_1$–$C_6$ alkoxyphenyl and halophenyl with HY, wherein Y is as previously defined in a suitable solvent at a temperature from about 0° to about 200° C. and recovering the substituted optically active 2,3,5,6-tetrahydroimidazo[2,1-b] thiazole acid addition salt of the free base.

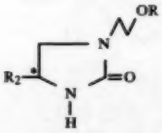
4. A method for the preparation of an optically active compound of the formula:



wherein $R_2$ is selected from the group consisting of phenyl and halophenyl which comprises hydrolyzing an optically active imidazolidone of the formula:



wherein $R_4$ is selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, phenoxy, $C_5$–$C_{10}$ cycloalkyl, phenyl, and phenyl or phenoxy substituted with up to four groups selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, halo and trifluoromethyl and R is selected from the group consisting of hydrogen, $C_1$–$C_6$ alkyl, halo, $C_1$–$C_6$ alkyl, phenyl, phenyl substituted with up to three groups selected from the group consisting of $C_1$–$C_6$ alkyl, halo and $C_1$–$C_6$ alkoxy and $COR_3$, wherein $R_3$ is selected from the group consisting of hydrogen, $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, phenoxy, halo $C_1$–$C_6$ alkyl, phenyl and phenyl or phenoxy substituted with up to four groups selected from the group consisting of $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, halo and trofluoromethyl by heating said optically active imidazolidone from about 70° to about 100° C. in the presence of a hydroxide source in water or alcohol to afford an optically active imidazolidone of the formula:



wherein $R_2$ is as previously defined and R is selected from the group consisting of hydrogen, $C_1$–$C_6$ alkyl, halo, $C_1$–$C_6$ alkyl, phenyl, and phenyl substituted with up to three groups selected from the group consisting of $C_1$–$C_6$ alkyl, halo and $C_1$–$C_6$ alkoxy, refluxing said optically active imidazolidone with a reagent capable of substituting sulfur for oxygen in a suitable solvent at a temperature from about 80° C. to about 200° C. and recovering the substituted optically active 2,3,5,6-tetrahydroimidazo[2,1-b]thiazole.

**4,370,483**

## PROCESS FOR THE MANUFACTURE OF 2-HYDROXYBENZOTHIAZOLES

**Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Apr. 29, 1981, Ser. No. 258,604**

**Claims priority, application Fed. Rep. of Germany, May 5, 1980, 3017153**

**Int. Cl.³ C07D *239/88***

**U.S. Cl. 548—165** **5 Claims**

1. A process for the manufacture of a 2-hydroxybenzothiazole compound which comprises reacting at a temperature within the range of 80°–200° C. a 2-aminobenzothiazole compound with an alkali metal hydroxide or alkaline earth metal hydroxide in a substantially anhydrous solvent or diluent medium stable to alkalis, said medium containing less than about 2.5 weight % of water, relative to the reaction mixture, and cyclizing the alkali metal or alkaline earth metal salt of the ortho-mercapto-N-phenylurea compound so obtained, by heating the ortho-mercapto-N-phenylurea compound with an acid to a temperature in the range from 40° to 100° C.

---

**4,370,484**

## SCEPTRIN AN ANTIMICROBIAL AGENT FROM *AGELAS SCEPTRUM*

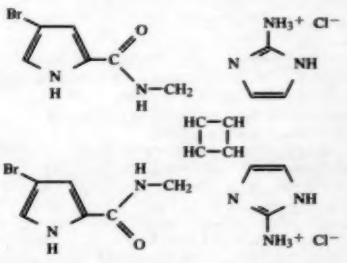
**D. John Faulkner, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**

**Filed Mar. 12, 1981, Ser. No. 242,728**

**Int. Cl.³ C07D *403/14***

**U.S. Cl. 548—316** **5 Claims**

1. An antimicrobial agent having the formula:



or the free amine thereof, or a lower aliphatic carboxylic acid amide of said free amine, or another mineral acid salt of said free amine, a tautomer of any of said compounds, or any of said compounds associated with water of crystallization.

---

**4,370,485**

## GERMAAZASPIRODIONES

**Chester M. McCloskey, 1981 Sinaloa Ave., Altadena, Calif. 91001; James R. Fischer, 3930 Mural Dr., Claremont, Calif. 91711, and Leonard F. Scott, 245 Mira Mar Ave., Long Beach, Calif. 90803**

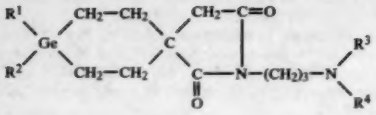
**Continuation-in-part of Ser. No. 33,429, Apr. 26, 1979, Pat. No. 4,248,785. This application Sep. 27, 1979, Ser. No. 79,328**

**The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.**

**Int. Cl.³ C07F *7/30***

**U.S. Cl. 548—404** **28 Claims**

1. A dialkylgermaazaspirodione compound in crystalline form and having the formula:



wherein $R^1$ and $R^2$ are the same or different alkyl groups of 1 to 4 carbon atoms and $R^3$ and $R^4$ are the same or different alkyl groups of 1 to 4 carbon atoms.

5. N-(3-dimethylaminopropyl)-2-aza-8,8-dibutyl-8-germaspiro[4:5]decane-1,3-dione in crystalline form.

---

**4,370,486**

## BIPHENYL COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS INTERMEDIATE PRODUCTS FOR OPTICAL BRIGHTENERS, DYESTUFFS, PLASTICS AND MEDICAMENTS

**Horst Harnisch, Much, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

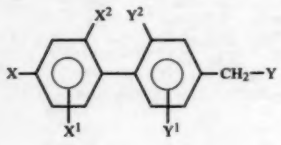
**Filed Aug. 14, 1981, Ser. No. 292,868**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3033002; Dec. 19, 1980, 3048088**

**Int. Cl.³ C07C** *103/38, 103/76*

**U.S. Cl. 549—46** **3 Claims**

1. Compounds of the formula



wherein

X represents hydrogen, $—CH_2—Y$, $SO_3H$ or a radical A,

A represents $C_1$–$C_6$-alkyl, trifluoromethyl, cyclohexyl, $C_1$–$C_4$-alkoxy, chlorine, bromine or fluorine,

$X^1$ represents hydrogen, methyl, chlorine or $SO_3H$,

$X^2$ represents hydrogen or methyl,

Y represents an acetamido or propionylamido radical which is substituted in the α-position by 1 to 3 halogen atoms, or a phthalimido group, or a benzamido group optionally substituted on the nucleus by up to three $C_1$–$C_4$-alkyl, chlorine, bromine, methoxy, ethoxy, nitro and/or cyano groups and or at the amido nitrogen atom by a $C_1$–$C_2$-alkyl group,

$Y^1$ represents hydrogen, methyl or $SO_3H$ and

$Y^2$ represents hydrogen, or

$X^2$ and $Y^2$ together form an ethylene radical or a $—SO_2—$ bridge,

with the proviso that at least one radical Y represents halogen-substituted acetamido or propionylamido or optionally substituted benzamido if the compounds are free from sulphonic acid groups or from $—SO_2—$ bridges.

---

**4,370,487**

## PROCESS FOR, RESPECTIVELY, THE PRODUCTION AND PURIFICATION OF DICARBOXYLIC AND POLYCARBOXYLIC ACID ANHYDRIDES

**Gerhard Meyer, Blumenstr. 26, 8753 Obernburg, and Erich Klimesch, Berlinerstr. 11, 8765 Erlenbach, both of Fed. Rep. of Germany**

**Filed Apr. 15, 1981, Ser. No. 254,384**

**Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015988**

**Int. Cl.³ C07D** *307/60, 493/04*

**U.S. Cl. 549—242** **5 Claims**

1. Process for, respectively, the production and purification of dicarboxylic and polycarboxylic acid anhydrides by dehydration of the respective dicarboxylic or polycarboxylic acids or, in given instances, by dehydration of the respective dicarboxylic or polycarboxylic acids contained in the anhydrides to be purified, characterized by heating at temperatures from 120° to 200° C., the dicarboxylic or polycarboxylic acid, or, respectively, the anhydride to be purified, in an organic solvent in the presence of activated carbon, and by removing the water becoming free thereby in azeotropic solution with the solvent.

---

**4,370,488**

## ALKALI METAL COMPLEX COMPOUNDS

**Borislav Bogdanovic, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mülheim, Fed. Rep. of Germany**

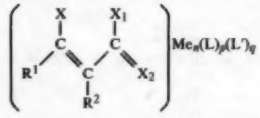
**Division of Ser. No. 115,595, Jan. 28, 1980, Pat. No. 4,301,081, which is a division of Ser. No. 905,489, May 12, 1978, Pat. No. 4,229,354. This application Jun. 18, 1981, Ser. No. 274,947**

**Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722221**

**Int. Cl.³ C07C** *57/03, 153/023;* **C07D** *307/06*

**U.S. Cl. 549—429** **9 Claims**

1. An alkali metal complex compound of general formula I



I

wherein Me represents an alkali metal, each $X$,$X_1$ and $X_2$ represents sulphur or oxygen with the proviso that X and $X_1$ are the same, n represents a whole number from 3 to 20, L and L′ represent a mono- or polyfunctional ether or amine, respectively, p and q are whole numbers from 0 to 4, $R^1$ and $R^2$ are each hydrogen, alkyl, cycloalkyl, aralkyl or aryl moieties and/or two or more such moieties closed to form an aliphatic or aromatic ring system.

---

**4,370,489**

## HERBICIDAL COMPOUNDS

**Heinz Boesenberg, Langenhain; Gerhard Hörlein, Frankfurt am Main; Helmut Köcher, Hofheim, and Peter Langelüddeke, Diedenbergen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

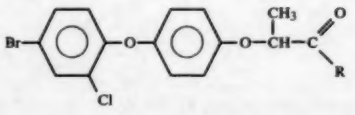
**Filed Jan. 14, 1977, Ser. No. 759,490**

**Claims priority, application Fed. Rep. of Germany, Jan. 16, 1976, 2601548**

**Int. Cl.³ C07C** *69/76*

**U.S. Cl. 560—62** **14 Claims**

1. Compounds of the formula I



I

in which R represents hydroxyl, ($C_1$–$C_{10}$) alkoxy, but not the iso-propoxy or n-butoxy member thereof, ($C_1$–$C_6$)-alkylthio, ($C_2$–$C_4$) alkenyloxy, cyclohexyloxy, cyclopentyloxy, phenoxy or phenylthio both optionally substituted once or twice with halogen, benzyloxy, benzylthio or -O-cat in which "cat" stands for the cation of an inorganic or organic base.

## 4,370,490

## PROCESS FOR PRODUCING METHACRYLIC ACID BY OXIDATIVE DEHYDRATION OF ISOBUTYRIC ACID AND CATALYST THEREFOR

**Wilhelm Gruber, Darmstadt, and Günter Schröder, Ober-Ramstadt, both of Fed. Rep. of Germany, assignors to ROHM GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany**

**Filed Aug. 28, 1981, Ser. No. 297,279**

**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032423; Feb. 2, 1981, 3103410**

**Int. Cl.³ C07C *51/377, 57/05, 67/317***

**U.S. Cl. 560—214** **21 Claims**

1. A process for producing methacrylic acid or an ester thereof comprising contacting in gaseous phase in presence of oxygen isobutyric acid or the corresponding ester thereof with a metal oxide catalyst substantially free of sulfate and consisting essentially of oxides of molybdenum, vanadium, phosphorus, and a metal selected from the group consisting of alkali metals, alkaline earth metals, zinc, silver, aluminum, titanium, lead, manganese, iron, cobalt, nickel, and tin.

---

## 4,370,491

## CONTINUOUS PREPARATION OF ACETIC ACID ESTERS

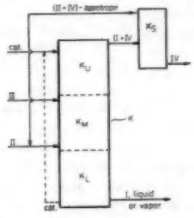
**Kaspar Bott, Wachenheim; Gerd Kaibel, Lampertheim; Herwig Hoffmann, Frankenthal; Rudolf Irnich, Bobenheim, and Eberhard Schaefer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

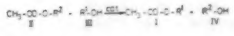
**Filed May 14, 1981, Ser. No. 263,470**

**Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019767**

**Int. Cl.³ B01D *3/36*; C07C *67/02, 67/06***

**U.S. Cl. 560—234** **5 Claims**



1. In a process for the preparation of an acetic acid ester of the formula

$$CH_3—CO—O—R^1 \qquad I$$

where $R^1$ is an organic radical other than methyl or ethyl, by alkali-catalyzed trans-esterification of an acetic acid ester of the formula

$$CH_3—CO—O—R^2 \qquad II$$

where $R^2$ is methyl or ethyl, with an alcohol

$$R^1—OH \qquad III$$

accompanied by removal of the alcohol

$$R^2—OH \qquad IV,$$

the improvement which comprises:

(a) carrying out the trans-esterification reaction in the middle section $K_M$ of a distillation column K, the alcohol III being fed as liquid into the upper zone and the ester II into the lower zone of $K_M$, using 1 mole up to not more than 3 moles of the ester II per mole of the alcohol III,

(b) introducing the alkaline catalyst into the upper part $K_U$ of the column K,

(c) separating a mixture of the alcohol IV and the ester II obtained in the upper part $K_U$ of the column into the alcohol IV alone and an azeotropic mixture of II and IV, recycling said azeotropic mixture to the lower zone of $K_M$, and

(d) withdrawing the ester I from the lower zone of the lower section $K_L$ of the column K.

---

## 4,370,492

## PREPARATION OF VINYL ACETATE FROM ETHYLENE, ACETIC ACID AND OXYGEN IN THE GASEOUS PHASE

**Friedrich Wunder, Flörsheim am Main; Therese Quadflieg; Günter Roscher, both of Kelkheim, and Günther Heck, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Division of Ser. No. 20,038, Mar. 13, 1979. This application Sep. 5, 1980, Ser. No. 184,532**

**Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811115**

**Int. Cl.³ C07C *67/055***

**U.S. Cl. 560—245** **12 Claims**

1. In a process for the preparation of vinyl acetate in the gaseous phase by reacting ethylene with acetic acid and oxygen or oxygen-containing gases in the presence of a catalyst containing a noble metal of sub-group VIII of the periodic table, or a compound thereof, and as an activator an alkali metal compound, an alkaline earth metal compound or a cadmium compound, or any combination thereof, the improvement which comprises applying said noble metal and said activator onto a carrier consisting essentially of particles of silicic acid having a star-shaped cross section with a core portion and at least 3 star points with a core diameter in the range of 2 mm to 4 mm, an average radius of 1.5 mm to 7.5 mm as measured by the distance from the center of the core portion to the apex of a star point and an average indentation in the range of 0.5 mm to 6.5 mm as measured by the distance from the outer surface of the core portion to the apex of a star point.

---

## 4,370,493

## SYNTHESIS OF ALPHA-AMINO ACIDS

**Jefferson W. Davis, Jr., San Francisco, Calif., assignor to The United States of America as represented by the Secretary of Energy, Washington, D.C.**

**Division of Ser. No. 77,811, Sep. 21, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,106**

**Int. Cl.³ C07C *99/10***

**U.S. Cl. 562—444** **5 Claims**

1. An improved process for synthesizing an alpha-amino acid comprising:

reacting a metal cyanide with an aldehyde or a ketone in the absence of water to form a corresponding cyanohydrin of the formula:

$$R_1R_2C(OH)CN$$

wherein $R_1$ and $R_2$ represent hydrogen, alkyl radicals of 1 to 10 carbon atoms, alkenyl radicals of 2 to 4 carbon atoms, aryl radicals of 6 to 12 carbon atoms, alkaryl radicals of 7–8 carbon atoms, aralkyl radicals of 7–8 carbon atoms, and p-hydroxyphenyl radicals,

reacting said cyanohydrin with thionyl chloride to form a chlorosulfinyl nitrile of the formula:

$$R_1R_2C(OSOCl)CN,$$

reacting said chlorosulfinyl nitrile with formamide to form a nitrile sulfite of the formula:

$$[R_1R_2C(CN)O]_2\,SO,$$

reacting the nitrile sulfite so formed with ammonia to form an amino nitrile of the formula:

$$R_1R_2C(NH_2)CN;\ \text{and}$$

hydrolyzing said amino nitrile to the alpha-amino acid.

---

**4,370,494**

## CONVERTING ENZYME INHIBITORS

**George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.**

**Filed Jan. 15, 1982, Ser. No. 339,683**
**Int. Cl.³ C07C *101/26***
**U.S. Cl. 562—450** **1 Claim**

1. The compound N-(1-carboxy-3-phenylpropyl)glycyl-N'-(2,3-dihydro-1H-indene-1-yl)glycine.

---

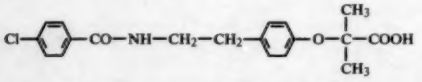
**4,370,495**

## PROCESS FOR THE PREPARATION OF α-[4-(4-CHLOROBENZOYLAMINOETHYL)-PHENOXY]-ISOBUTYRIC ACID

**Peter Beyer, Mannheim-Wallstadt, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany**

**Filed Apr. 17, 1979, Ser. No. 30,798**
**Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2820759**
**Int. Cl.³ C07C *99/00***
**U.S. Cl. 562—451** **6 Claims**

1. In a process for the preparation of 2-[4-(4-chlorobenzoylaminoethyl)-phenoxy]-2-methylpropionic acid of the formula



comprising reacting N-(4-chlorobenzoyl)-tyramine with acetone and chloroform, the improvement consisting of carrying out the reaction at a temperature of from about 20° to 40° C. in a mole ratio of 1:20–100:2–10 (tyramine:acetone:chloroform), and in the presence of 3 to 4 moles of alkali per mole of chloroform.

---

**4,370,496**

## PROCESS FOR CONTINUOUS PRODUCTION OF HIGH PURITY TEREPHTHALIC ACID

**Motoo Shigeyasu, and Michio Kuki, both of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan**

**Continuation of Ser. No. 671,929, Mar. 31, 1976, abandoned.**
**This application Oct. 20, 1978, Ser. No. 953,321**
**Claims priority, application Japan, Dec. 25, 1975, 50-155553**
**Int. Cl.³ C07C *51/42, 51/16***
**U.S. Cl. 562—487** **17 Claims**

1. In a process of continuously producing high purity terephthalic acid by continuously introducing one or more p-dialkylbenzenes into an oxidation reactor together with a solvent and an oxidation catalyst, subjecting the raw material to a liquid phase oxidation with molecular oxygen or molecular oxygen containing gas, and separating and recovering terephthalic acid formed from the reaction mixture, the improvement which comprises continuously or intermittently introducing the oxidation reaction product from the oxidation reactor into a stabilizer which can retain the oxidation reaction product from the oxidation reactor for 10 to 200 minutes and also can keep the volume change of the contents below 27% by volume even while oxidation reaction product is being introduced and oxidatively treating the oxidation reaction product in the stabilizer, to completely oxidize oxidizable materials selected from the group consisting of unreacted feed materials, reaction intermediate products and active compounds, for about 10 to 200 minutes at a temperature and pressure the same as or lower than those employed in the preceding oxidation reaction by continuously introducing a molecular oxygen containing gas selected from the group consisting of an off-gas exhausted from the oxidation reactor and a mixture thereof with air, said molecular oxygen containing gas having an oxygen concentration of 2 to 15 volume % so that the oxygen concentration in the reaction system does not exceed the explosive limit during said treatment and while maintaining the volume change of the contents in the stabilizer below about 27% by volume, by controlling the amount of the oxidation reaction product introduced from the oxidation reactor to the stabilizer and the amount of the oxidation reaction product discharged from the stabilizer, thereby to maintain the volume change of the contents below about 27% by volume.

---

**4,370,497**

## OXIDATION PROCESS USING TELLURIUM OXIDE CATALYSTS

**Derek H. R. Barton, Centre Residental du CNRS, 91190 Gif sur Yvette, France; Steven V. Ley, 10, Viney Bank, Addington, Surrey, United Kingdom (CR0 9JS), and Clive A. Meerholz, 14 Southhall Close, Ware, Hertfordshire, United Kingdom (SG12 7PE)**

**Filed Aug. 7, 1980, Ser. No. 175,847**
**Claims priority, application United Kingdom, Aug. 8, 1979, 7927604**
**Int. Cl.³ C07C *127/19***
**U.S. Cl. 564—55** **8 Claims**

1. A process for the preparation of a compound of formula:

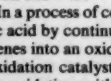
$$R^3(X^1)_mCO(X^2)_nR^4$$

wherein $X^1$ and $X^2$ which may be the same or different, each represents an oxygen or sulphur atom or the group —NH—; m and n, which may be the same or different are each 0 or 1; and $R^3$ and $R^4$, which may be the same or different, each represents a hydrogen atom, a $C_{1-5}$ alkyl or alkenyl group, a $C_{1-32}$ cycloalkyl group optionally including double bonds, a $C_{7-10}$ aralkyl group or a $C_{6-12}$ aryl group such groups optionally being substituted by halogen, amino, carboxyl, hydroxy, $C_{1-6}$ alkyl and/or $C_{1-6}$ alkoxy; or $R^3$ and $R^4$ together form a ring(s) which may possess up to 32 carbon atoms and which may have double bonds and be optionally substituted by halogen, amino, carboxyl, hydroxy, $C_{1-6}$ alkyl and/or $C_{1-6}$ alkoxy

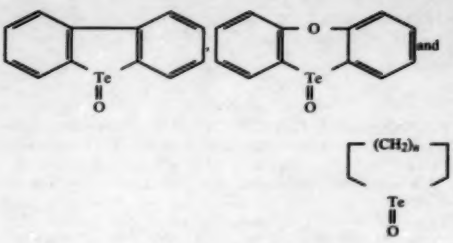
which process comprises oxidising a compound of formula:

$$R^3(X^1)_mCY(X^2)_nR^4$$

wherein Y represents a sulphur or selenium atom; and $X^1$, $X^2$, $R^3$, $R^4$, m and n are as herein defined by means of a telluroxide of the formula:



wherein R and $R^1$, which may be the same or different each represent a phenyl group optionally substituted by halogen, $C_{1-6}$ alkyl, phenyl, phenoxy, di($C_{1-6}$ alkyl) amino, hydroxy, carboxy, chlorocarbonyl, nitro and/or $C_{1-6}$ alkoxy optionally substituted by an alkoxycarbonyl group in which the alkoxy moiety contains 1 to 6 carbon atoms; or R and $R^1$ together with the tellurium atom therebetween represent a group selected from




in which n is 0 or 1, which group may optionally be substituted by halogen, $C_{1-6}$ alkyl, phenyl, phenoxy, di($C_{1-6}$ alkyl) amino, hydroxy, carboxy, chlorocarbonyl, nitro or $C_{1-6}$ alkoxy optionally substituted by an alkoxycarbonyl group in which the alkoxy moiety contains 1 to 6 carbon atoms.

---

**4,370,498**

## PREPARATION OF α-KETOCARBOXYLIC ACID N-ACYLAMIDES

**Gerhard Bonse, Cologne, and Heinz U. Blank, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Feb. 19, 1981, Ser. No. 235,497**

**Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009044**

**Int. Cl.³ C07C *102/08, 103/147, 103/19, 103/24***

**U.S. Cl. 564—155** **15 Claims**

1. An α-ketocarboxylic acid N-acylamide of the formula

$$R^1—CO—CO—NH—CO—R^2$$

in which

$R^1$ is an optionally substituted aliphatic radical with up to 12 carbon atoms, an optionally substituted cycloalkyl radical with 3 to 10 carbon atoms, an optionally substituted heterocyclic radical, and

$R^2$ is an optionally substituted aliphatic radical with up to 8 carbon atoms or an optionally substituted phenyl radical.

5. A process for the preparation of α-ketocarboxylic acid N-acylamide according to claim 1, comprising reacting an acyl cyanide of the formula

$$R^1—CO—CN$$

with a carboxylic acid anhydride of the formula

$$R^2—CO—O—CO—R^2$$

in the presence of a strong acid at a temperature between about −50° and +150° C., the molar ratio of the acyl cyanide to the carboxylic acid anhydride being from about 1:0.5 to 1:10, the molar ratio of acid to acyl cyanide being from about 0.5:1 to 10:1 and the molar ratio of carboxylic acid anhydride to acid being about 1:2, and then adding water to the reaction mixture.



---

**4,370,499**

## 3-NITRO-ACETOACETANILIDES, PROCESSES FOR THEIR PREPARATION AND THEIR USE

**Heinz U. Blank, Odenthal; Erich Wolters, Niederzier; Karl W. Müller, Leverkusen, and Günter Rottloff, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed May 13, 1981, Ser. No. 263,388**

**Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020443**

**Int. Cl.³ C07C *103/34***

**U.S. Cl. 564—200** **1 Claim**

1. 2-Chloro-5-nitro-pivaloyl-acetanilide.

---

**4,370,500**

## COMPOUND: *D*-N-(2-AMINO-2-PHENETHYL)-2-METHOXYETHYLAMINE AND PROCESS FOR PREPARING THE SAME BY SELECTIVE CRYSTALLIZATION

**Nancy S. Kurose, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Nov. 6, 1978, Ser. No. 958,216**

**Int. Cl.³ C07C *87/28***

**U.S. Cl. 564—304** **5 Claims**

1. The compound: d-N-(2-amino-2-phenethyl)-2-methoxyethylamine.

2. A process for the recovery of the compound of claim 1, d-N-(2-amino-2-phenethyl)-2-methoxyethylamine, which comprises the steps of: forming a slurried solution of a mixture of dl-N-(2-amino-2-phenethyl)-2-methoxyethylamine, and dibenzoyl-d-tartaric acid in an aqueous acidic menstruum containing ammonium chloride, refluxing the resultant slurried solution, cooling the latter, filtering and decomposing the latter to obtain the desired d-N-(2-amino-2-phenethyl)-2-methoxyethylamine enantiomer in good optical purity and yield.

---

**4,370,501**

## SYNTHESIS OF BIS(AMINOPHENYL) COMPOUNDS

**Kreisler S. Y. Lau, Alhambra, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Oct. 5, 1981, Ser. No. 308,324**

**Int. Cl.³ C07C *87/50***

**U.S. Cl. 564—330** **8 Claims**

1. A process for conversion of bisphenols to dianilines comprising the steps of:

a. forming the reaction product of an anhydrous bis-phenol and a halogenated phenyl-quinazoline by heating said compounds in the presence of a crown ether catalyst, a strong base, and a high-boiling polar solvent;

b. subjecting said product to a thermal rearrangement by heating it in an inert atmosphere to thereby form a bis-quinazolinone; and

c. hydrolyzing said bis-quinazolinone by refluxing it in the presence of a strong base in an alcoholic solvent, thereby forming a dianiline.

---

**4,370,502**

## PROCESS FOR PRODUCING P-NITROANILINE

**Taira Harada, Mitaka; Toyozi Shimizu, Iwakuni, and Takenori Nagaoka, Tokyo, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan**

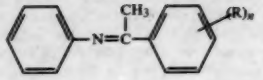
**Filed Mar. 13, 1981, Ser. No. 243,496**

**Claims priority, application Japan, Mar. 17, 1980, 55-32626**

**Int. Cl.³ C07C *85/24, 87/60, 119/10***

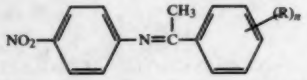
**U.S. Cl. 564—411** **7 Claims**

1. A process for producing a p-nitroaniline, which comprises nitrating an α-methylbenzalaniline of the formula



wherein R represents an alkyl group having 1 to 5 carbon atoms, and n is 0 or 1,

with nitric acid having a concentration of at least 90% in the presence of a halogenated aliphatic hydrocarbon solvent and concentrated sulfuric acid to form a p-nitro-α-methylbenzalaniline of the formula



wherein R and n are as defined above, and hydrolyzing the p-nitro-α-methylbenzalaniline.

---

**4,370,503**

## CATALYST FOR METHYLAMINES PRODUCTION

**Loren D. Brake, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 24, 1981, Ser. No. 247,136**
**Int. Cl.³ C07C *85/02, 85/06***
**U.S. Cl. 564—474** **3 Claims**

1. In the catalytic preparation of methylamines from methanol or dimethyl ether and ammonia using a silica-alumina catalyst, the improvement which comprises using a catalyst which contains, by weight, 1–13% of silica and 87–99% of alumina.

---

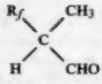
**4,370,504**

## PROCESS FOR PRODUCING PERFLUOROCARBON GROUP-CONTAINING ALDEHYDES

**Iwao Ojima, and Takamasa Fuchikami, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Japan**

**Filed Mar. 4, 1981, Ser. No. 240,361**
**Claims priority, application Japan, Mar. 7, 1980, 55/28061**
**Int. Cl.³ C07C *45/50***
**U.S. Cl. 568—454** **5 Claims**

1. A process for producing an aldehyde containing a perfluorocarbon group represented by the formula:



wherein $R_f$ represents a perfluoroalkyl group having up to 20 carbon atoms, a perfluoroaryl group having 6 to 10 carbon atoms, or a perfluorocycloalkyl group having 5 to 8 carbon atoms,

which comprises reacting an olefin containing a perfluorocarbon group represented by the formula:

wherein $R_f$ is as defined above,

with carbon monoxide and hydrogen in the presence of a rhodium catalyst which is $Rh(PY_3)_3X$, $Rh(CO)(PY_3)_2X$, $HRh(CO)(PY_3)_3$, $Rh_6(CO)_{16}+mPY_3$, $Rh/C+mPY_3$, $RhCl_3+mPY_3$, $[RhCl(C_8H_{12})]_2+mYP(CH_2)_4PY_2$, $[Rh(C_8H_{12})_2]^+Z^-+mPY_3$, $[Rh(norbornadiene)_2]^+Z^-+mY_2P(CH_2)_2PY_2$, or $[Rh(CO)_2Cl]_2+mPY_3$, wherein X represents halogen, Y represents phenyl, substituted phenyl, phenoxy, substituted phenoxy, benzyl, substituted benzyl, alkyl, substituted alkyl, alkoxy, substituted alkoxy, or dialkylamino, Z represents $ClO_4$, $BF_4$, $PF_6$ or $BPh_4$, ph represents phenyl, and m is a number of 1 to 50.

---

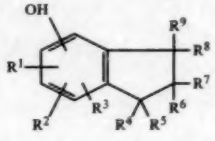
**4,370,505**

## 1,1,3,3-SUBSTITUTED HYDROXYINDANES

**Alfons Klein, Dusseldorf; Karlfried Wedemeyer, Cologne, and Jürgen Thies, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 664,729, Mar. 8, 1976, abandoned, which is a continuation of Ser. No. 431,801, Jan. 8, 1974, Pat. No. 3,954,889. This application Dec. 21, 1977, Ser. No. 863,019**
**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1973, 2304588; Apr. 16, 1973, 2319079**
**Int. Cl.³ C07C *39/12***
**U.S. Cl. 568—734** **11 Claims**

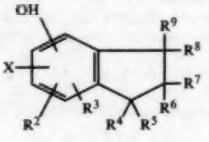
1. 1,1,3,3-substituted hydroxy-indanes of the formula



wherein

$R^1$ is selected from the group of hydrogen, halogen and optionally substituted alkyl having up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl part and up to 14 carbon atoms in the aryl part and phenyl, naphthyl or anthranyl and the foregoing substituted by alkyl with up to 12 carbon atoms; or

$R^1$ is of the group



wherein

X is sulfur of the group

$R^2$ and $R^3$ can be the same or different and are selected from the group of hydrogen, halogen and optionally substituted alkyl of up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl part and up to 14 carbon atoms in the aryl part, phenyl, naphthyl and anthranyl and the foregoing substituted by alkyl with up to 12 carbon atoms; or, if

$R^2$ and $R^3$ are in the ortho position to each other, they can form a condensed carbocyclic 5-membered ring together with the carbon atoms of the benzene ring to which they are attached as substituents,

$R^4$, $R^5$, $R^8$ and $R^9$ are the same or different and are selected from the group of optionally substituted alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl part and up

to 14 carbon atoms in the aryl part, phenyl, naphthyl and anthranyl or the foregoing substituted by alkyl with up to 12 carbon atoms; or

$R^4$ and $R^5$ and/or $R^8$ and $R^9$ can form a cycloaliphatic ring together with the carbon atom to which they are attached as substituents;

$R^6$ and $R^7$ are the same or different and are selected from the group consisting of optionally substituted alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl part and up to 14 carbon atoms in the aryl part, phenyl, naphthyl, anthranyl and the foregoing substituted by alkyl with up to 12 carbon atoms, hydrogen or $R^6$ and $R^7$ can form a carbocyclic ring together with the carbon atom to which they are attached as substituents;

where any group of $R^1$ to $R^9$ is substituted it is substituted by an alkyl group of up to 12 carbon atoms and $R^{10}$ and $R^{11}$ can be identical or different and are selected from the group of hydrogen and optionally substituted alkyl with up to 12 carbon atoms where the substituent is an alkyl group with up to 12 carbon atoms or $R^{10}$ and $R^{11}$ can form a cycloaliphatic ring together with the carbon atom to which they are attached as substituents.

---

**4,370,506**

## TERBUTYLATING HYDROXYAROMATIC COMPOUNDS

**Francesco Ancillotti, San Donato Milanese; Giuseppe Terzoni, Piacenza; Lidio Micucci, Milan; Paolo Maggioni, Montevecchia, and Pietro Panseri, Bergamo, all of Italy, assignors to Anic S.p.A., Palermo, Italy**

**Filed Jul. 24, 1981, Ser. No. 286,612**

**Claims priority, application Italy, Aug. 6, 1980, 24025 A/80**

**Int. Cl.³ C07C *37/11***

**U.S. Cl. 568—785** **4 Claims**

1. In a process for the terbutylation of a phenolic compound by means of an alkyltert-butyl ether, comprising the steps of reacting in a first stage said phenolic compound in substantially stoichiometric ratios at a temperature comprised between 60° C. and 130° C. in the presence of a catalyst of acidic nature, the improvement consisting of removing the alcohol which is formed in said first stage and completing the reaction, after said alcohol removal, under substantially the same reaction conditions used in said first stage.

---

**4,370,507**

## ETHANOL FROM METHANOL AND SYNTHESIS GAS

**Duane C. Hargis, Pleasant Ridge, and Michael Dubeck, Birmingham, both of Mich., assignors to Ethyl Corporation, Richmond, Va.**

**Division of Ser. No. 186,217, Sep. 11, 1980. This application Jan. 8, 1982, Ser. No. 338,088**

**Int. Cl.³ C07C *29/00***

**U.S. Cl. 568—902** **6 Claims**

1. A process for selectively producing ethanol which comprises reacting methanol with carbon monoxide and hydrogen in the presence of a heterogenous catalyst comprising rhodium and iron in the reduced state deposited on a support of alumina impregnated with a promoter amount of a heterocyclic amine at reaction conditions correlated so as to favor the formation of a substantial proportion of ethanol.

---

**4,370,508**

## PARA-SELECTIVE ZEOLITE CATALYSTS TREATED WITH NITROGEN COMPOUNDS

**Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Jun. 26, 1981, Ser. No. 277,485**

**Int. Cl.³ C07C *2/68***

**U.S. Cl. 585—467** **12 Claims**

1. A process for converting aromatic compounds to a dialkyl benzene compound mixture highly enriched in the para-dialkylbenzene isomer, said process comprising contacting said aromatic compounds under conversion conditions with a modified zeolite based catalyst comprising a crystalline zeolite material characterized by a silica to alumina ratio of at least 12 and a constraint index of from about 1 to 12, said catalyst having been modified by treatment with a para-selectivity-enhancing oxide material and further having been contacted with a nitrogen-based treating agent selected from nitrogen dioxide and ammonia under para-selectivity enhancing conditions.

4,370,509

## SOLAR CELL ARRAY

Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,926
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036261; Jun. 23, 1981, 3124581
Int. Cl.³ H01L 31/04
U.S. Cl. 136—244 4 Claims

1. A solar cell array comprising solar cells which are connected together electrically, in which the electrical connections between the solar cells are strips or wires comprising amorphous metals.

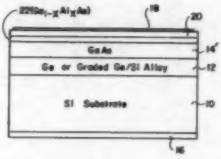
---

4,370,510

## GALLIUM ARSENIDE SINGLE CRYSTAL SOLAR CELL STRUCTURE AND METHOD OF MAKING

Richard J. Stirn, Pomona, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sep. 26, 1980, Ser. No. 191,008
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—262 8 Claims




6. A solar cell comprised of a single crystal silicon substrate, a single-crystal interlayer, and a single-crystal GaAs film epitaxially grown on said interlayer, said interlayer being comprised of epitaxial single-crystal semiconductor material having a closer match in lattice and thermal expansion with single-crystal GaAs than with the single-crystal silicon of said substrate, a back contact on said substrate and a grid contact on said film said interlayer being comprised of step graded germanium-silicon alloy, with low germanium content at the silicon substrate interface, and a high germanium content at the upper surface.

---

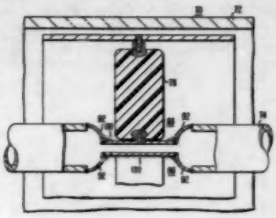
4,370,511

## FLEXIBLE GAS INSULATED TRANSMISSION LINE HAVING REGIONS OF REDUCED ELECTRIC FIELD

Alan H. Cookson, Pittsburgh; William H. Fischer, Wilkins Township, Allegheny County; Kue H. Yoon, Pittsburgh, and Jeffry R. Meyer, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 17, 1981, Ser. No. 244,587
Int. Cl.³ H01B 9/06, 9/04; H02G 5/06
U.S. Cl. 174—14 R 43 Claims

1. A transmission line, comprising:
(a) an outer conductor;
(b) an inner conductor adapted for connection to an energizing source and disposed interiorly within said outer conductor;
(c) support means for insulatedly supporting said inner conductor within said outer conductor; and
(d) radially flexible field control means for reducing at a



predetermined location along the periphery of said inner conductor the electric field created when said inner conductor is energized and permitting radial flexing of said inner conductor.

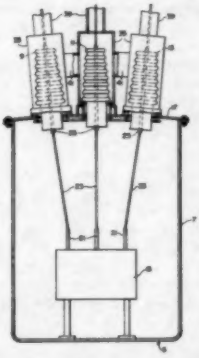
---

4,370,512

## SHIELDING DEVICE FOR ELECTRICAL INDUCTIVE STRUCTURE

Michael W. Thomas, Marshall, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1981, Ser. No. 237,016
Int. Cl.³ H01F 27/34, 27/04
U.S. Cl. 174—18 4 Claims

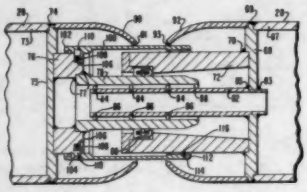


1. An electrical inductive structure for eliminating power losses, comprising:
(a) a tank having a metal wall including openings therein;
(b) electrical inductive apparatus within the tank and having terminals thereon;
(c) a bushing extending through each opening;
(d) conductor means extending through each bushing and connected to the terminals;
(e) an electrically conductive shielding member within the tank and disposed between the openings and having portions extending through the openings;
(f) electrically conductive means externally of the tank and comprising a bus duct housing disposed about each bushing and electrically connected to the portions of the shielding member; and
(g) an air return conduit between the bus duct housings and electrically insulated from the bus duct housings and being spaced from the tank wall.

## 4,370,513
## SEMI-FLEXIBLE GAS-INSULATED TRANSMISSION LINE USING PROTECTION TUBE IN CONDUCTOR PLUG-IN JOINT

**Prasad R. Kommineni, Westboro, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Mar. 30, 1982, Ser. No. 363,755**
**Int. Cl.³ H01B** *9/06, 9/04;* **H02G** *5/06*
**U.S. Cl. 174—21 JS** **4 Claims**



1. A gas-insulated transmission line comprising:
an elongated outer sheath;
a cylindrical first main conductor having a first diameter disposed within said outer sheath and having an end thereto;
a first element fixedly secured to said first main conductor end and extending radially inwardly therefrom;
a socket member fixedly secured to said first element and extending longitudinally outwardly therefrom, said socket member having a second diameter less than said first diameter;
a cylindrical second main conductor having said first diameter disposed within said outer sheath and having an end thereto spaced-apart from said first main conductor end;
a second element fixedly secured to said second main conductor end and extending radially inwardly therefrom;
an adapter member fixedly secured to said second element and extending longitudinally outwardly therefrom;
a hollow plug member fixedly secured to said adapter member and extending outwardly therefrom into said socket member, said plug member and said socket member being in electrical contact;
a rigid protection tube fixedly secured to said first element and extending outwardly therefrom into said plug member, said protection tube having a plurality of circumferentially extending bearing strips secured about the outer surface thereof, said bearing strips contacting the inner surface of said plug member;
an insulating gas electrically insulating said first and second main conductors from said outer sheath; and
means for insulatably supporting said first and second main conductors in said outer sheath.

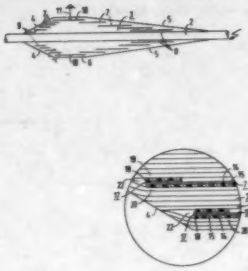
---

## 4,370,514
## HIGH-VOLTAGE BUSHING WITH DOUBLE-LAYERED POTENTIAL CONTROL INSERTS

**Günther Matthäus, Spardorf, and Joachim Ruffer, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Nov. 3, 1980, Ser. No. 203,373**
**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946172**
**Int. Cl.³ H01B** *17/28*
**U.S. Cl. 174—31 R** **4 Claims**

1. A high voltage insulating bushing of the type having at least one conductor part at a high voltage with respect to at least a second conductor part at a reference potential, the insulating bushing further having an insulator body formed of wound insulating foils with at least one electrically conductive potential control insert disposed within preselected insulating foil windings in the insulator body, the high voltage insulator bushing comprising:
at least one double layer foil which forms the electrically conductive potential control insert, said double layer foil being prefabricated in the form of continuous and coextensive contiguous layers of electrically conductive material and insulating material, said insulating material having a high dielectric constant $\epsilon_r$, said double layer foil being



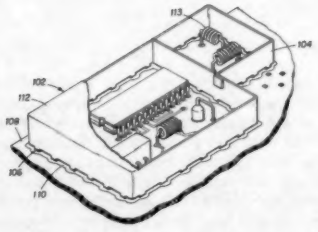
folded upon itself along an edge near an outer boundary surface of the insulating body to form an edge wherein said electrically conductive layer is enclosed within said insulating layer of said double layer foil; and
an insulation medium impregnating the high voltage insulating bushing.

---

## 4,370,515
## ELECTROMAGNETIC INTERFERENCE

**Jay W. Donaldson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Continuation-in-part of Ser. No. 106,600, Dec. 26, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,721**
**Int. Cl.³ H05K** *9/00*
**U.S. Cl. 174—35 R** **10 Claims**




1. An electromagnetic interference (EMI) shielding structure, comprising: first and second planar elements, at least one of the planar elements comprising a ground-plane circuit of a printed circuit board, the printed circuit board having a plurality of apertures therein and an electronic circuit thereon; walls intermediate the planar elements, the walls including a plurality of tabs projecting from a longitudinal edge of the walls, each of the tabs extending into a corresponding one of the plurality of apertures of the printed circuit board and connected electrically to the ground-plane circuit, the planar elements being spaced apart by the walls, and means for attaching the walls to the planar elements, the EMI shielding structure defining an enclosure bound peripherally by the walls and the planar elements including at least a portion of the ground-plane circuit, the electronic circuit being electromagnetically isolated inside the enclosure, the walls being formed of a continuous strip of metal having a corner formed therein by manually bending the strip of metal, the corner including a groove across the strip of metal on one side thereof interiorly of the

corner to facilitate the bending, the groove having a depth essentially half the thickness of the strip of metal and a width which predetermines the degree of bending of the metal strip, the groove including first and second edges where the groove intersects the one side, the edges abutting each other to limit the degree of bending of the strip of metal.

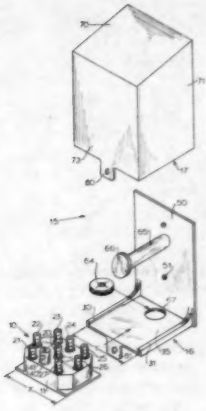
---

**4,370,516**

## COOPERATIVE TV-FM CABLE SPLITTER-GROUND MODULE AND HOUSING THEREFOR

**Arvin K. Bailey, Jr., 113 Estes Dr. Extension, and Richard S. Taylor, 115 Estes Dr. Extension, both of Carrboro, N.C. 27510**

**Filed May 11, 1981, Ser. No. 262,035**
**Int. Cl.³ H05K *5/00***
**U.S. Cl. 174—59** **3 Claims**



1. A coaxial cable TV-FM signal splitter-ground module, module support and associated housing adapted for establishing a standard type of signal splitting and local electrical grounding installation for varying numbers of signal receivers to be serviced from a common incoming signal cable, comprising:

(a) a signal splitter-ground module having an input cable port, a selected number and at least one output port, splitting means adapted to split an incoming signal received at said input cable port and derive therefrom a selected number and at least one of other signals selectively conducted to said number of output ports, a metal enclosure enclosing said splitting means and mounting said ports with one side of each said port being electrically grounded through said enclosure and at least one dimension of said enclosure being of a predetermined selected standard length, a grounding connector comprising means electrically connected to said enclosure and adapted to releasably receive one end of a ground wire having another portion connected to electrical ground for grounding said enclosure and the side of each said port electrically grounded therethrough; and

(b) a support-housing structure adapted for being detachably secured to a building and for releasably receiving and providing weather protective covering for said splitter-ground module and the signal coupling connections associated therewith, said support-housing structure comprising:

(i) a horizontal rectangular base wall member defined by front, back and side edges, having securing means sized to accommodate said splitter-ground module enclosure dimension and adapted for slidably receiving and supporting a portion of said splitter-ground module enclosure incorporating said dimension and for supporting said splitter-ground module within the confines of said base wall member, having an aperture formed in said base wall member in a central, rearwardly located portion thereof and adapted for passage of incoming and outgoing cables to be coupled to said ports;

(ii) a vertical rectangular back wall member secured to the said back edge of said base wall member and extending upwardly therefrom in perpendicular relation thereto, said back wall member being adapted to be secured to a building structure for supporting said base wall member with said module thereon;

(iii) a horizontal post member secured to and extending outwardly from said back wall member and overlying and vertically spaced above said splitter-ground module, said post member being adapted to receive and support selected service loop portions of incoming and outgoing cables above said splitter-ground module; and

(iv) a housing formed for slidable fit on said back wall member and having top, side and front wall portions adapted when said housing is installed on said back wall member to provide in cooperation with said base and back wall members a weather-protected enclosure surrounding said splitter-ground module, said post member and those service loop portions of cabling supported on said post member.

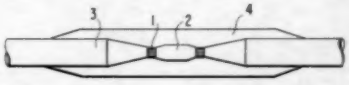
---

**4,370,517**

## POLYOLEFIN COMPOSITIONS FOR ELECTRICAL INSULATION

**Kenichiro Soma; Shoji Kuma; Harunori Sakaguchi; Hisanari Shirai; Ryoichi Ito, and Toshio Shiina, all of Ibaraki, Japan, assignors to Hitachi Cable Limited, Tokyo, Japan**

**Continuation of Ser. No. 974,271, Dec. 28, 1978, abandoned. This application Dec. 18, 1980, Ser. No. 217,926**
**Claims priority, application Japan, Dec. 29, 1977, 52-159423; Dec. 6, 1978, 53-151268**
**Int. Cl.³ H02G *15/02*; D03D *13/00***
**U.S. Cl. 174—74 A** **10 Claims**



1. A polyolefin insulated electric cable exhibiting the effect of suppressed water tree formation which comprises an electrical insulation layer provided around a conductor, said insulation layer comprising a polyolefin grafted with an ester type polyfunctional monomer, which polyolefin contains 0.01 to 0.888% by weight of ester groups.

---

**4,370,518**

## SPLICE FOR LEAD-COATED AND INSULATED CONDUCTORS

**Raymond L. Guzy, Morton Grove, Ill., assignor to Hughes Tool Company, Houston, Tex.**

**Continuation of Ser. No. 99,692, Dec. 3, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,400**
**The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.**
**Int. Cl.³ H01R *4/70*; H02G *15/08***
**U.S. Cl. 174—84 R** **8 Claims**

6. A cable splice comprising:

a metallic sleeve member extending over conductor end portions and frictionally engaging the conductor end portions;

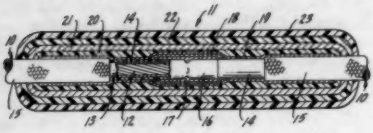
a first layer of adhesive covering said sleeve member and extending over exposed conductor end portions;

a helically wrapped insulation layer of uncured thermoset-

ting elastomeric polymer tape surrounding said layer of adhesive;

an overlapped layer of fabric;

a helically-wrapped layer of heat-shrinkable polymeric material tape surrounding said layer of fabric;



a sleeve of heat shrinkable polymeric material surrounding said layer of heat shrinkable polymeric material tape; and

a layer of foil located intermediate said metallic sleeve member and said helically-wrapped layer of heat-shrinkable polymeric material tape, said layer of foil being covered with a second layer of adhesive covering.

---

**4,370,519**

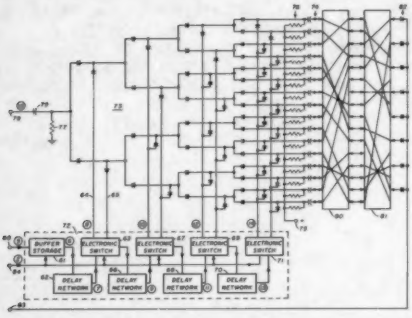
## AUTOKEY GENERATOR FOR SECRET COMMUNICATION SYSTEM

**Beryl L. McArdle, Rochester, N.Y., assignor to General Dynamics Corporation, San Diego, Calif.**

**Filed Dec. 6, 1949, Ser. No. 131,436**

**Int. Cl.³ H04L** *9/00, 7/08*

**U.S. Cl. 178—22.14** **4 Claims**



1. An autokey generator adapted for use in a secret communication system, comprising the combination of a source of binary digit pulse intelligence signals in digital mark-space form having a predetermined number of digital pulse intervals in each intelligence signal interval; a plurality of bistable switch means connected in sequence, each said switch means having a tripped state and a reset state, a source of reset signals connected to each of said switch means, said reset signals occurring at the end of each digit interval; means for tripping the first said switch means in response to the receipt of a mark pulse from said source of intelligence signals; means for setting each said switch means, except the first, in accordance with the state of the preceding said switch means upon the receipt of a said reset pulse, each said switch means having at least a pair of output terminals furnishing output signals of opposite polarity; diode matrix means having a plurality of output terminals, responsive to the respective outputs of said switch means for energizing individual ones of said output terminals in correspondence with particular combinations of output signals from said switch means, said matrix means being operated to pass said output signals from said switch means to one of said output terminals at a given instant, depending uniquely upon the configuration of polarities then present on said output terminals of said switch means, an autokey code output terminal, and means for connecting fewer than all of said output terminals of said matrix means in parallel to said autokey code output terminal, whereby said autokey code appearing on said autokey code output terminals contains a pattern of pulses determined by, but different from, the pattern of pulses appearing in said intelligence signals.

---

**4,370,520**

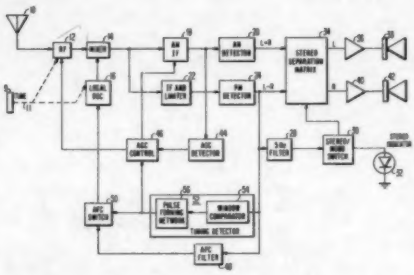
## AM STEREO RECEIVER

**Max E. Malchow, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed May 26, 1981, Ser. No. 266,984**

**Int. Cl.³ H04B** *1/12;* **H04H** *5/00*

**U.S. Cl. 179—1 GS** **5 Claims**



1. In an AM stereo system including tuning means for tuning said system to various RF signals corresponding to respective stations to produce an IF signal, at least one gain controlling stage responsive to an AGC signal, and AGC means for generating said AGC signal in response to the strength of said received RF signals, apparatus comprising:

tuning detector means for providing a first signal when said receiver is not being tuned and a second signal when said receiver is being tuned; and

gain control means operating in conjunction with said AGC means and responsive to said first signal for establishing a first IF amplitude versus received RF signal strength characteristic and responsive to said second signal for establishing a second IF amplitude versus received RF signal strength characteristic, which second characteristic has a greater slope than said first characteristic.

---

**4,370,521**

## ENDPOINT DETECTOR

**James D. Johnston, Millington, N.J.; Lori F. Lamel, Cambridge, Mass.; Lawrence R. Rabiner; Aaron E. Rosenberg, both of Berkeley Heights, N.J., and Jay G. Wilpon, North Plainfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 19, 1980, Ser. No. 218,207**

**Int. Cl.³ G10L** *1/00*

**U.S. Cl. 179—1 SC** **22 Claims**

1. Apparatus for determining endpoints of an applied speech utterance in a noise prone environment comprising:

means for receiving an input signal including a speech utterance;

means responsive to said input signal for generating digital signals corresponding thereto;

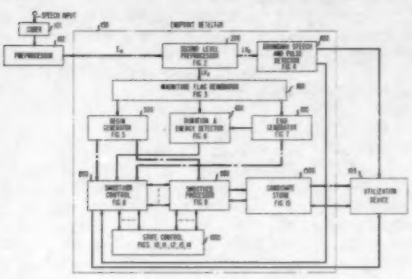
means responsive to said digital signals for developing signals representative of the energy levels of said digital signals;

means responsive to said energy level signals for detecting the endpoints of said applied speech utterance;

characterized in that said endpoint detecting means (150) comprises:

means (300, 500, 600, 700) responsive to said energy level

signals for developing a plurality of energy signal pulses, each energy signal pulse corresponding to a sequence of said energy level signals which exceeds a prescribed level for at least a predetermined period of time; and



means (800, 900, 1000) responsive to said energy signal pulses for developing a plurality of endpoint candidate signals, each of said endpoint candidate signals being representative of probable beginning and ending points of said applied speech utterance.

---

**4,370,522**

## FM RECEIVER FOR USE WITH MOTORCARS

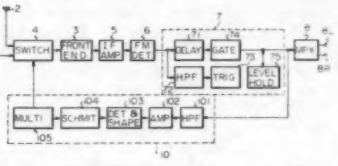
**Shigeki Takeda; Junichi Shibata; Masashi Shimakata; Yasuhiro Oshime; Shintaro Gomi, and Katsuaki Kawamura, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Mar. 3, 1981, Ser. No. 241,460**

**Claims priority, application Japan, Mar. 3, 1980, 55-26274; Mar. 3, 1980, 55-27291[U]**

**Int. Cl.³ H04N *5/00*; H01Q *1/00, 1/32, 3/00***

**U.S. Cl. 179—1 GD** **6 Claims**



1. An FM receiver comprising:

at least two receiving directional antennas which have directions of maximum sensitivity different from each other;

demodulating circuit adapted to demodulate a frequency-modulated signal wave into a low frequency signal substantially corresponding to the original modulating signal;

pulse noise suppressing means connected to said demodulating circuit for suppressing high frequency noise components in said low frequency signal;

multipath noise detecting circuit connected to said pulse noise suppressing means for monitoring the output signal of said pulse noise suppressing means and generating alternately one of at least two predetermined control signals when multipath noise components with frequencies lower than said high frequency noise components appear in the output of said pulse suppressing means;

switching means connected to said multipath noise detecting circuit for selectively connecting, in response to said control signals, one of said antennas to the input of said demodulating circuit; and

a multiplex decoding circuit connected to said pulse noise suppressing means for decording the low frequency signal into the multiplexed original signals.

**4,370,523**

## PROCESS AND APPARATUS FOR CONVERTING SOUND WAVES INTO DIGITAL ELECTRICAL SIGNALS

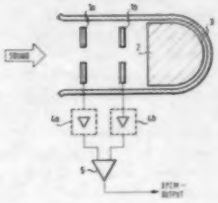
**Karl O. Bäder, Lahr, Fed. Rep. of Germany**

**Filed May 27, 1981, Ser. No. 267,478**

**Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020247**

**Int. Cl.³ H04R *1/20***

**U.S. Cl. 179—1 DM** **11 Claims**



1. A process for converting sound waves into digital electrical signals wherein the sound waves are continuously simultaneously detected by first and second electro-acoustic transducers which are disposed at a spacing from each other in the direction of incidence of the sound and which thereby produce electrical signals in dependence on the received sound, and a respective difference pulse code modulation signal in the form of a 1-bit signal is formed from the comparison of each two electrical signals which respectively correspond to two said simultaneously detected sound waves.

---

**4,370,524**

## CIRCUIT FOR TIME COMPRESSION AND EXPANSION OF AUDIO SIGNALS

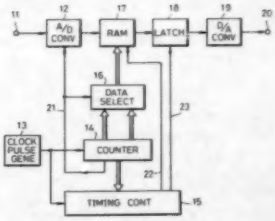
**Seisuke Hiraguri, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**

**Continuation-in-part of Ser. No. 962,794, Nov. 20, 1978, abandoned. This application Oct. 9, 1980, Ser. No. 195,639**

**Claims priority, application Japan, Nov. 22, 1977, 52-139439**

**Int. Cl.³ G10L *1/00***

**U.S. Cl. 179—15.55 T** **7 Claims**



1. A time compression or expansion circuit for audio signals comprising:

(a) an analog to digital converter for converting an input audio signal to a digital signal;

(b) a random access memory coupled to said analog to digital converter for writing in and reading out the digital signal supplied from said analog to digital converter;

(c) a latch circuit coupled to the output of said random access memory for holding a signal which has been read out from said random access memory;

(d) a digital to analog converter coupled to said latch circuit for converting the output of said latch circuit to an analog signal and producing and output analog signal which is

compressed or expanded in time base with respect to said analog signal;

(e) a clock pulse generator for generating a clock pulse;

(f) a counter circuit for counting the clock pulses from said generator and for producing as outputs thereof an address datum for writing-in of which address changes at a first predetermined rate, an address datum for reading-out of which address changes at a second predetermined rate different from said first predetermined rate, a writing-in and reading-out switching signal, and a timing signal;

(g) a data selector for sending alternatively and selectively the address datum for writing-in and the address datum for reading-out supplied from the counter circuit, to said random access memory, in response to the writing-in and reading-out switching signal supplied from said counter circuit; and

(h) a timing controller supplied with the clock pulse from the generator and the timing signal from the counter circuit for producing a series of writing-in pulses and a series of strobe pulses which exist alternatively and have a common frequency regardless of mode of compression or expansion or rate thereof, said analog to digital converter converting the input audio signal to the digital signal in response to the writing-in and reading-out switching pulse from the counter circuit, said random access memory writing the signal from the analog to digital converter, in response to the writing-in pulse fed from the timing controller, into an address thereof designated by the address datum for writing-in, and reading a signal out of an address designated by the address datum for reading-out in response to the strobe pulse of said common frequency, the written address of the memory being read multiple times or skipped being read according to said mode and rate, said latch circuit holding the signal read out from the random access memory in response to the strobe pulse from the timing controller.

---

**4,370,525**

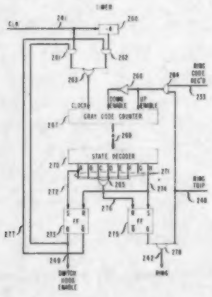
## VARIABLE RATE TIMING CIRCUIT

**Gordon K. Francis, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 24, 1980, Ser. No. 209,886**

**Int. Cl.³ H04Q** *11/04;* **H03K** *17/296, 21/30*

**U.S. Cl. 179—16 A** **7 Claims**



**1.** A timing circuit comprising

a sequential circuit (**267**),

at least two sources (**261,262**) of clock pulses of differing repetition rates,

means (**273**) responsive to the output of said sequential circuit for selectively connecting said sources of clock pulses to said sequential circuit, and

means for selectively advancing or reversing the states of said sequential circuit.

---

**4,370,526**

## ARRANGEMENT FOR APPLYING A RINGING VOLTAGE TO A SUBSCRIBER'S LINE

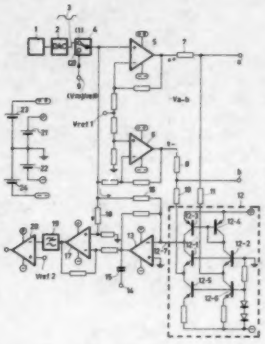
**Franciscus A. C. M. Schoofs; Aloysius J. Nijman, and Frederik van Dongen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 2, 1981, Ser. No. 230,214**

**Claims priority, application Netherlands, Feb. 12, 1980, 8000859**

**Int. Cl.³ H04M** *19/02*

**U.S. Cl. 179—51 AA** **3 Claims**



**1.** An arrangement for applying a combination of a d.c. voltage signal and a low-frequency a.c. voltage signal to a subscriber's line of an automatic telephony system, the low-frequency a.c. voltage signal being used to actuate a ringing device forming part of the subscriber's apparatus, comprising a low-frequency a.c. voltage generator from which two low-frequency a.c. voltages are derived which are applied in antiphase phases to different wires of the subscriber's line, characterized in that means have been provided for forming the two low-frequency a.c. voltages such that the low-frequency a.c. voltage between the wires has a waveform in which the portion of each period during which the said low-frequency a.c. voltage is positive with respect to the mean level of the said low-frequency a.c. voltage differs from the portion during which the said low-frequency a.c. voltage is negative, the mean level being located halfway between the extreme values of the said low-frequency a.c. voltage, as a result of which the low-frequency a.c. voltage between the wires of the subscriber's line has a direct current component which may be used as the d.c. voltage signal.

---

**4,370,527**

## ARRANGEMENT FOR FEEDING A SUBSCRIBER DEVICE

**Günter W. Ruff, Auenwald, and Hartmut Scheffler, Aspach, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Feb. 27, 1981, Ser. No. 239,103**

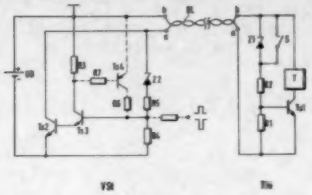
**Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007549**

**Int. Cl.³ H04M** *19/00*

**U.S. Cl. 179—70** **14 Claims**

**1.** In a circuit for supplying operating power from a power supply at a central office to a telephone device at a subscriber location via a two-wire line, and including switching means at the subscriber location actuatable to effect connection of the telephone device to the power supply to place the device into operation, the improvement comprising: a first switching device connected between said power supply and said line for controlling the supply of power to said line; and a second switching device connected between said line and said tele-

phone device for controlling the delivery of power from said line to said telephone device, with each said switching device



being connected to switch in response to the traversing of a threshold by the voltage or the current which is on the two-wire line and which is caused by said power supply.

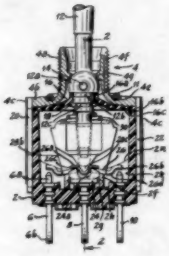
---

**4,370,528**

## MINIATURE SEALED TOGGLE SWITCH

**Louis F. Aschenbach, Menomonee Falls, Wis., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Mar. 16, 1981, Ser. No. 243,687**
**Int. Cl.³ H01H *21/04***
**U.S. Cl. 200—6 BB** **20 Claims**



1. A miniature environmentally sealed toggle switch adapted for mounting on a panel comprising:

a housing having a base provided with a contact compartment and a cover having a bushing for extending through a hole in the mounting panel;

stationary contacts in said compartment having terminals extending through said base to the outside;

a movable contactor supported on one of said stationary contacts serving as a pivot therefor and being rockable in opposite directions to engage and disengage at least one other stationary contact;

a toggle lever extending down through said bushing and means pivotally supporting said toggle lever in said bushing for pivotal movement limited by said bushing;

an actuator engaging said contactor and being slidable therealong to rock the same;

means coupling said toggle lever to said actuator comprising a hole in said actuator into which the inner end portion of said toggle lever extends and a frustoconical compression spring biasing said actuator against said contactor so that said actuator slides along said contactor and concurrently rocks in unison with said toggle lever as the latter is pivotally operated from one operating position to another;

and sealing means comprising a gasket hugging said toggle lever below its pivot and means stretching said gasket to the periphery of said base and said cover.

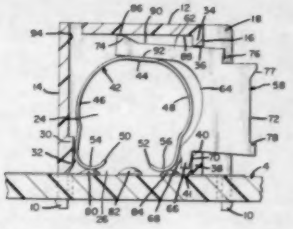
---

**4,370,529**

## SWITCH HAVING SWITCH CONTACTS ENGAGEABLE DIRECTLY WITH CIRCUIT BOARD CONTACTS

**Winfield W. Loose, Linglestown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Nov. 16, 1981, Ser. No. 321,880**
**Int. Cl.³ H01H *15/00, 9/20***
**U.S. Cl. 200—16 D** **12 Claims**



1. A switch which is intended for mounting on a circuit board, the switch comprising a prismatic insulating housing having oppositely facing external endwalls, an external top-wall, oppositely facing external sidewalls extending between the endwalls, and a base, at least one switch cavity in the housing, the cavity having a switch contact and an actuator therein, the switch being characterized in that:

the cavity has a first opening at the base of the housing and a second opening in one of the external walls other than the endwalls,

the cavity has an elongated circuitiously formed spring therein, the spring having spaced-apart ends which are proximate to the first opening, the ends having switch contacts thereon, at least one of the ends being movable upon the application and removal of a flexing force to an intermediate portion of the spring,

the actuator being movably contained in the cavity and being in engagement with the intermediate portion of the spring, the actuator having an engageable portion which projects through the second opening in the housing which can be engaged by an externally applied force to push the actuator into the associated cavity, the actuator being normally in a first position in which the engageable portion projects through the second opening to an extended position,

the actuator being movable inwardly of the cavity to a depressed position upon application of an external force to the engageable portion with accompanying application of a flexing force to the intermediate portion of the spring whereby, the switch can be mounted on a circuit board with the switch contacts associated with a pair of circuit board contacts and with the switch contacts against the circuit board contacts when the actuator is in one of its positions, at least one of the switch contacts being spaced from its associated circuit board contact when the actuator is moved to its other position.

---

**4,370,530**

## ELECTROLYTIC CELL ELECTRICAL SHUNTING SWITCH ASSEMBLY

**Paul O. Wayland, Montour Falls, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

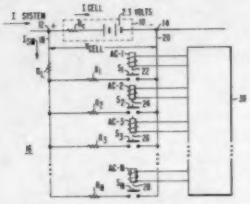
**Filed May 28, 1980, Ser. No. 154,153**
**Int. Cl.³ H01H *33/66***
**U.S. Cl. 200—144 B** **10 Claims**

1. An electrical shunting switch assembly adapted to be electrically connected in parallel across an electrolytic cell, which assembly comprises;

(a) a plurality of electrically parallel branch conductor paths each of which includes a vacuum switch and a series

resistance of predetermined value in each parallel switch containing branch, so that the current in each respective parallel branch is limited to a predetermined design value, and

(b) means for asynchronously operating the vacuum



switches to divert an increased portion of the current from the switch assembly back through the cell when the voltage across the switch assembly exceeds the cell electrolyzing potential, whereby the arc current which an individual vacuum switch must dissipate upon switch opening is limited to the predetermined design value.

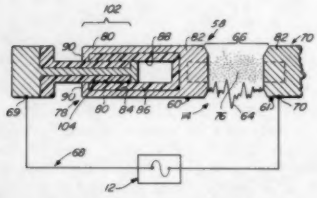
---

**4,370,531**

## ELECTRIC SWITCH AND IMPROVED DEVICE USING SAME

**Thomas J. Tobin, Northbrook, Ill., assignor to S&C Electric Company, Chicago, Ill.**

**Filed Sep. 19, 1980, Ser. No. 188,660**
**Int. Cl.³ H01H *33/06***
**U.S. Cl. 200—151** **20 Claims**



1. An electrical switch for opening a first current path in which the switch is included, comprising:

a pair of normally electrically interconnected contacts for carrying current in the first current path, the contacts being relatively movable apart along a fixed line of direction to break the electrical interconnection therebetween and to open the first current path, at least one of the interconnected contacts defining an enclosed chamber;

a terminal in the first current path;

means for

(a) electrically connecting a first of the contacts to the terminal when the contacts are electrically interconnected so that the terminal and contacts are in series in the first current path, and

(b) electrically insulating the first contact from the terminal as and when the contacts move apart; and

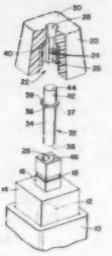
ignitable means within the chamber for pressurizing the chamber upon ignition thereof to rapidly drive the contacts apart.

**4,370,532**

## LIGHTED ELECTRICAL PUSHBUTTON SWITCH

**Todd C. Green, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Feb. 23, 1981, Ser. No. 237,346**
**Int. Cl.³ H01H *3/12***
**U.S. Cl. 200—314** **3 Claims**



1. A lighted pushbutton switch comprising a light source, a housing that houses said light source, an actuating pushbutton mounted for reciprocating movement in said housing, said pushbutton having a keycap retaining post that extends therefrom, a keycap that has a retaining means which cooperates with said post to secure said keycap on said keypost, said keypost also having a passageway which extends all the way through said keypost into the interior of said housing so that it is in alignment with said light source, and said keycap having a channel therein which is in light communication with said passageway so that light from said light source that passes through said passageway will also pass through said channel said keycap to an outside viewer and a light pipe that has a first section which inserted into said passageway and a second section which projects into said channel, said keycap including a cavity adapted to surround the key post, the passageway in the keycap communicating with the cavity, said light pipe including abutment and alignment means situated between the first and second sections and adapted to cooperate with a surface on the cavity of the keycap and the free end surface of the key post after said keycap is assembled onto the post.

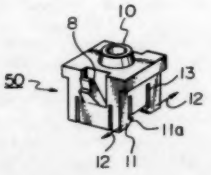
---

**4,370,533**

## KEYBOARD SWITCH AND PROCESS FOR PRODUCTION THEREOF

**Seisuke Kamei, Nagano; Hideo Nabetani, and Ryohei Kinoshita, both of Suzaka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 5, 1980, Ser. No. 213,402**
**Claims priority, application Japan, Dec. 10, 1979, 54/160030**
**Int. Cl.³ H01H *3/12, 13/52***
**U.S. Cl. 200—340** **9 Claims**



1. A push-button switch having in a housing thereof a switch contact spring driven by the vertical movement of a drive rod which comprises: a plate spring element having an upwardly extending drive-rod support-portion and a bent switch contact

spring-driving portion extending transversely downwardly from the drive-rod support portion of the plate element for engagement with the switch contact spring, wherein said drive rod is formed of a molded synthetic resin fixedly mounted around the support-portion of the plate spring element, and wherein said drive rod drives said switch contact spring through the switch contact spring-driving portion, the contact spring-driving portion further acting as a return spring for the drive-rod.

---

**4,370,534**

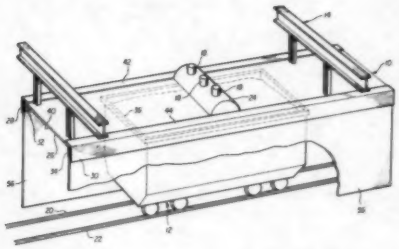
## APPARATUS AND METHOD FOR HEATING, THAWING AND/OR DEMOISTURIZING MATERIALS AND/OR OBJECTS

**Deryck Brandon, P.O. Box 176, Charlottesville, Va. 22902**

**Continuation-in-part of Ser. No. 229,523, Jan. 29, 1981, abandoned, which is a continuation of Ser. No. 28,601, Apr. 9, 1979, Pat. No. 4,256,944. This application Mar. 25, 1981, Ser. No. 247,261**

**Int. Cl.³ H05B *6/80***

**U.S. Cl. 219—10.55 A** **18 Claims**



1. An apparatus for heating, thawing and/or demoisturizing materials stored in a gondola-type container having an open face and a predetermined length and width, comprising:

shielding hood means adapted for forming a shielded microwave cavity in combination with said container, said hood means defining a longitudinal axis and having front and back ends separated by a distance along said longitudinal axis of at least twice the length of said container, said hood means comprising shielding means for blocking microwave leakage from the microwave heating cavity formed by said hood means and said container, said shielding means disposed in contacting engagement with said container to form said cavity in the space enclosed between said shielding hood means and said container;

microwave radiation means mounted in the middle of said shielding hood means for radiating the materials within the container with microwave energy upon contacting engagement of the shielding hood means and the container; and

means adapted for transporting said container from the front end to the back end of said hood means with said shielding means in contacting engagement with said container, said microwave radiation means radiating said materials as said materials pass adjacent thereto;

whereby the materials stored in the container within the microwave cavity formed by the container and the shielding hood means are heated, thawed, and/or demoisturized by the microwave energy produced by the microwave radiation means.

**4,370,535**

## MICROWAVE OVEN POWER CONTROL SYSTEM

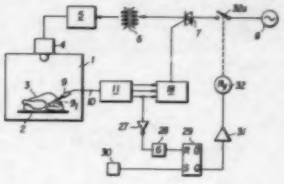
**Tomimitsu Noda, Fuji, Japan, assignor to Tokyo Shibaura Denki Kaioushiki Kaisha, Kawasaki, Japan**

**Continuation of Ser. No. 90,684, Nov. 2, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 274,867**

**Claims priority, application Japan, Nov. 6, 1978, 53-152533**

**Int. Cl.³ H05B *6/68***

**U.S. Cl. 219—10.55 B** **10 Claims**



1. A microwave oven having an open cavity, comprising:

an electric power source;

a magnetron for generating microwave energy in the oven cavity in which frozen foods to be thawed are placed, wherein the frozen food is thawed by absorption of the microwave generated by said magnetron; and

thawing control means coupled to said magnetron in order to control the power of said magnetron during a thawing operation, said control means comprising,

sensor means for detecting the temperature of the food placed in the oven cavity, and

temperature setting means for decreasing the magnetron power output step by step in response to the food temperature detected by the sensor means to thaw the food without impairment thereof,

comparator means connected to said sensor means and provided with at least one preset temperature signal with which the detected food temperatures from said sensor means are compared to generate at least one comparison result,

shift register means for producing duty cycle signals for differing predetermined time duration,

gating means coupled to said comparator means and said shift register means for producing a magnetron duty cycle control signal based on a logical combination of said at least one comparison result and the duty cycle signals produced by said shift register means,

wherein the duty cycle of said magnetron is controlled based on said duty cycle control signal to control the magnetron energy output in dependence on the temperature of the food placed in the oven cavity.

---

**4,370,536**

## EFFICIENCY ADAPTIVE EDM APPARATUS AND METHOD

**Jean-Pierre Kruth, Heverlee, Belgium, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland**

**Filed May 7, 1980, Ser. No. 147,507**

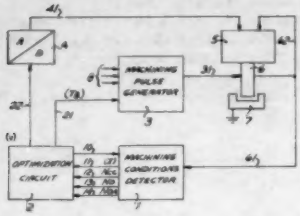
**Claims priority, application Switzerland, May 8, 1979, 4302/79**

**Int. Cl.³ B23P *1/08***

**U.S. Cl. 219—69 M** **12 Claims**

1. A method for machining by electrical discharges an electrode workpiece by means of an electrode tool, wherein consecutive voltage pulses are applied between the electrodes for machining by electro-erosion said electrode workpiece, and wherein a magnitude representing the machining performance index is obtained and a machining parameter is automatically varied by incremental steps such as to provide said magnitude with a maximum value, said method comprising determining a curve representing said magnitude as a function of said ma-

chining parameter and giving to each consecutive incremental step a first value when said curve has a positive slope and a second value when said curve has a negative slope, said second value being greater than said first value.




---

4,370,537

## ELECTRIC DISCHARGE MACHINE

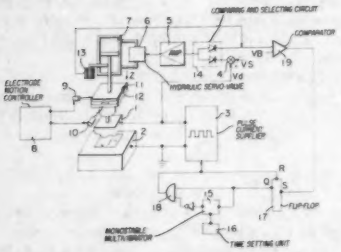
Toshiro Oizumi; Tetsuro Ito, and Shigeo Yamada, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00112, § 371 Date Jan. 29, 1981, § 102(e) Date Jan. 29, 1981, PCT Pub. No. WO80/02665, PCT Pub. Date Dec. 11, 1980

PCT Filed May 27, 1980, Ser. No. 232,030

Int. Cl.³ B23P 1/14

U.S. Cl. 219—69 V 8 Claims




1. An electric discharge machine comprising: an electric power source for supplying an electric discharge machining energy between an electrode and a workpiece to be machined; feeding means for effecting the relative feeding motions of said electrode and said workpiece in a certain direction; and means for effecting such relative rocking motions as have a directional component perpendicular to said certain direction, whereby said electric discharge machining energy is supplied from said electric power source, while effecting the rocking motions by said rocking motion effecting means, thereby to make it possible to accomplish a rocking machining operation, wherein the improvement comprises: position detecting means for detecting that said electrode and said workpiece take a predetermined positional relationship in said certain direction; means made responsive to the signal from said detecting means to maintain a signal outputting condition; and means for generating a command for effecting said rocking machining operation by the output signal from said means for a predetermined time period sufficient to provide a uniform machining on each part of said workpiece when and after said predetermined positional relationship is taken and means for holding said electrode and said workpiece in said predetermined positional relationship, said holding means being adapted to control said relative feeding motion effecting means in response to the signal of said position detecting means thereby to hold said electrode and said workpiece in said predetermined positional relationship.

---

4,370,538

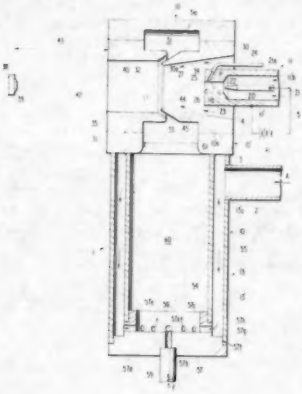
## METHOD AND APPARATUS FOR ULTRA HIGH VELOCITY DUAL STREAM METAL FLAME SPRAYING

James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Filed May 23, 1980, Ser. No. 152,966

Int. Cl.³ B23K 9/00

U.S. Cl. 219—121 PY 14 Claims



1. A flame spraying method comprising the steps of:

forming a primary jet stream of melted material particles suspended in a very hot carrier gas,

igniting a fuel/air mixture in an internal burner combustion chamber to create high pressure, high temperature products of combustion within the confined volume of the combustion chamber,

discharging the hot products of combustion from said internal burner through a manifold nozzle closing off said combustion chamber as a converging annular flow from a circular series of closely spaced nozzle orifices or a narrow continuous slot of circumferential ring geometry including a diminished core section defining the inner envelope of said converging annular secondary jet stream,

introducing said primary jet stream molten particles within said carrier gas upstream of and axially into the secondary jet stream in the direction of flow of said secondary jet stream, and

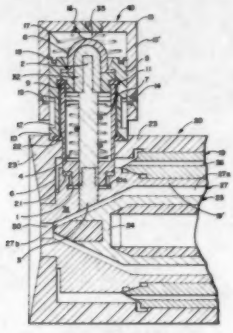
controlling combustion within said internal burner to accelerate said molten particles to supersonic velocity and to thereby create an extended length small diameter stream of molten particles downstream of said manifold nozzle of extremely high particle density for rapid, high bonding strength molten particle deposition on a surface to be coated, while maintaining the temperature of the secondary jet stream at a sufficiently high value to prevent solidification of the molten particles prior to impact on said surface.

4,370,539

## DEVICE FOR THE MANUAL START-UP OF A PLASMA TORCH

Dimo T. Garianov; Marin G. Beloev; Vladimir P. Hlebarov; Mariana V. Kolarova, and Ivan V. Vangelov, all of Sofia, Bulgaria, assignors to NPK za Kontrolno Zavarachni Raboti, Sofia, Bulgaria

Filed Oct. 7, 1980, Ser. No. 194,886
Int. Cl.³ B23K 9/16
U.S. Cl. 219—121 PW 3 Claims



1. In a plasmatron having an anode and cathode spaced from each other so as to sustain an arc therebetween, a nozzle disposed forwardly of the anode and cathode, and means to supply a stream of gas under pressure which flows between the anode and cathode and out of the nozzle, a manual start-up device comprising an electrically conductive plunger constituting a start-up electrode slidably mounted in and in electrical contact with a first one of said anode and cathode for selective advance movement toward and retraction from the second one of said anode and cathode, a first resilient means opposing the advance of the start-up electrode toward the second one of said anode and cathode, whereby to create an arc when the start-up electrode is retracted, away from the second one of said anode and cathode, from its fully advanced position, means mounting the start-up electrode, said start-up electrode mounting means being rotatable to a limited degree when it is in its retracted position, means automatically releasably locking the start-up electrode into its retracted position comprising a second resilient means constantly urging the start-up electrode mounting means and the electrode toward the terminus of their rotation wherein the start-up electrode mounting means and the start-up electrode are locked against axial movement, the means mounting the start-up electrode having an electrically insulated manually engageable means, whereby the start-up electrode mounting means and the start-up electrode may be turned against the action of the second resilient means to a position in which they are free for axial movement toward the second one of said anode and cathode.

4,370,540

## REFLECTIVE BEAM ROTATOR

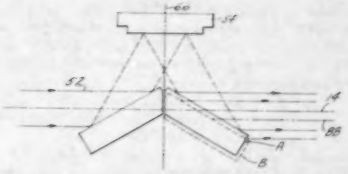
Jack W. Davis, East Hartford, and Paul R. Blaszuk, Lebanon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 1,038, Jan. 4, 1979. This application Nov. 24, 1980, Ser. No. 209,940
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LM 3 Claims

1. An improved method of altering a workpiece comprising the steps of:

(a) generating a beam of radiation having a first propagation direction, a predetermined beam area in a plane perpendicular to said propagation direction and a predetermined amount of power distributed in first intensity distribution in said predetermined beam area;

(b) directing substantially all of said predetermined amount of power in said beam onto said workpiece along a radiation path having a radiation axis, said amount of power being distributed in a plane perpendicular to said radiation axis with a second intensity distribution dependent on said first intensity distribution, whereby said radiation alters a parameter of said workpiece by a variable amount having



a parameter variation distribution dependent on said second intensity distribution, wherein the improvement comprises:

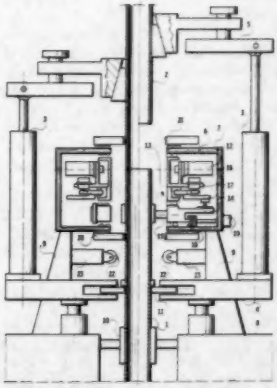
(c) directing substantially all of said predetermined amount of power in said beam simultaneously onto said workpiece and simultaneously rotating said second intensity distribution of said beam about said radiation axis, with a predetermined rate of rotation such that said parameter variation distribution of said workpiece increases in uniformity.

4,370,541

## ELECTRON BEAM CHAMBER FOR BUTT WELDING PIPES

Bruno de Sivry, Paris; Bernard Sodreau, Puteaux; Claude Carsac, St Leu la Foret; Jean-Pierre Hamon, Cergy, and Michel Fuzeau, Parthenay, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Apr. 21, 1981, Ser. No. 256,171
Claims priority, application France, Apr. 25, 1980, 80 09343
Int. Cl.³ B23K 15/00
U.S. Cl. 219—121 EC 9 Claims



1. An electron beam welding chamber for use in the butt joining of two elongate pipes which coaxially extend in their longitudinal directions at a center of the welding chamber, comprising: at least one electron gun (12), mounting equipment means (13) for supporting, positioning and displacing said electron gun in direct relation to a butt joint to be welded between two pipes, said mounting equipment means including clamping means (15) for directly gripping a first elongate pipe

(1) to which a second elongate pipe (2) is to be butt welded, an envelope (7) defining an enclosure (6) surrounding and interiorly containing said electron gun and associated mounting equipment means, a fixed structure coupled to and supporting said envelope, retractable, spaced sealing means (20, 21) individually provided at opposite longitudinal ends of said enclosure for sealing against the respective first and second pipes, said clamping means being disposed within said envelope and enclosure and between said spaced sealing means, means for creating a vacuum in said enclosure, and mechanical means (18,19; 24,25) for selectively connecting said mounting equipment means to said envelope to enable, in one position of said mechanical connection means, relative displacement between said mounting equipment means and said envelope such that with said envelope resting on said fixed structure, said mounting equipment means is rigidly connectable to the first elongate pipe by said clamping means.

---

**4,370,542**

## CABLE MARKING METHOD AND APPARATUS

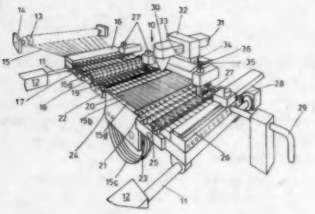
**John B. Mills, Yeovil, and Christopher H. Roberts, Crewkerne, both of England, assignors to Westland Aircraft Limited, Yeovil, England**

**Filed May 18, 1981, Ser. No. 264,847**

**Claims priority, application United Kingdom, May 22, 1980, 8016933**

**Int. Cl.³ B23K *9/00*; B41F *17/00***

**U.S. Cl. 219—121 LH** **16 Claims**



1. A method of marking an identification at pre-selected intervals along a cable length by laser marking means comprising the steps of arranging the cable with two longitudinally spaced-apart portions located in generally parallel juxtaposed relationship across a marking platen, sequentially moving an alternate one of the cable portions along the platen whilst maintaining the other portion stationary, and positioning and operating the laser marking means to mark a desired identification on the stationary one of said cable portions while said other cable portion is moving across the platen.

---

**4,370,543**

## SHOWER-SAUNA INSTANTANEOUS ELECTRIC STEAM OR HOT WATER SUPPLY UNIT

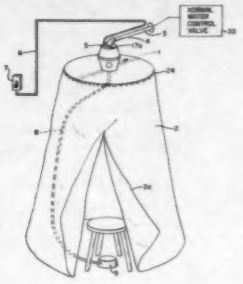
**Laszlo Nemeth, Carrera 67 #50-33, Bogata, Colombia**

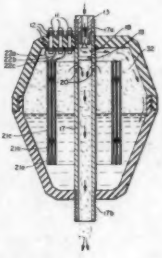
**Filed Oct. 6, 1980, Ser. No. 191,222**

**Int. Cl.³ F22B *1/30*; H05B *3/60*; A61H *33/06***

**U.S. Cl. 219—275** **8 Claims**

1. Apparatus for a shower and sauna comprising a container means of electrically insulative material for accommodating a volume of water, a substantially vertical central tube means extending through the container means for supplying water into the container means and removing hot water and steam from the container means, means provided on the upper end of the tube means for enabling a connecting of the central tube means to a source of water, means for automatically and instantaneously heating the volume of water in the container means so as to enable a generation of one of hot water and steam including a plurality of spaced tubular electrically conductive plates disposed in the container means and means for connecting the tubular plates with the source of electric current for passage of electric current through the water between the plates to generate Joule heat, means firmly mounting the tubular plates in the container means, means for mounting a sauna curtain on the container so as to define a sauna area below the container means including a flat dish-shaped member of a size and shape defining the top wall of the sauna area mounted on a lower end of the central tube means, means for releasably





securing the dish-shaped member to the central tube means, means provided in the central tube means for distributing the water supply to the container means and removing generated steam or hot water from the container means, the lower end of the central tube means forming an exit for steam and hot water to the sauna area and means provided for maintaining a predetermined spacing between the respective tubular plates.

---

**4,370,544**

## HAIR DRYER

**Nobuiti Fujishima, Hikone; Hideharu Nakano, Omihachiman, and Yukio Wada, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Dec. 12, 1980, Ser. No. 215,840**

**Claims priority, application Japan, May 15, 1980, 55-65505**

**Int. Cl.³ H05B *1/00*; A45D *20/12*; F04B *35/04***

**U.S. Cl. 219—370** **9 Claims**

1. A hair dryer comprising:

a housing including a pair of side walls and a recessed peripheral groove formed between said side walls,

electrically actuated air blowing means disposed in said housing and arranged to blow air through an air discharge port of said housing,

electrical actuated heating means in said housing for heating said air prior to discharge,

a manually movable switch assembly disposed in said housing,

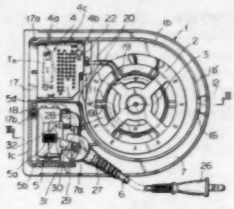
an electrical cord operably connectible to said blowing and heating means through said switch assembly which is manually movable between ON- and OFF-positions,

said cord including an exposed portion windable around said housing within said peripheral groove, and

a bushing movably disposed in said housing and connected to said cord, said bushing being movable between

a first position in response to said cord being wound in said groove and with said switch assembly in said OFF-position, and

a second position when said cord is unwound,



said switch assembly and said bushing including mutually cooperative surfaces arranged for mutual engagement when said bushing is in said first position and said switch assembly is in said OFF-position, to prevent said switch assembly from being moved to the ON-position,

said surfaces being arranged to mutually disengage when said bushing is moved to said second position in response to unwinding of said cord, to enable said switch assembly to be moved to the ON-position.

---

**4,370,545**

## COOKING APPARATUS

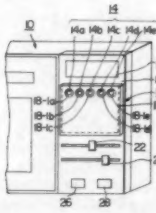
**Kouichi Hotta, Yachio; Yukichi Yazawa, Kashiwa, Japan, and Osami Tatsukawa, Matsudo, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Kashiwa, Japan**

**Filed Oct. 29, 1980, Ser. No. 201,765**

**Claims priority, application Japan, Oct. 30, 1979, 54-140155**

**Int. Cl.³ H05B 1/02**

**U.S. Cl. 219—491** **4 Claims**



1. A cooking apparatus comprising: heating means; a plurality of cooking program cards; a card holder for accommodating therein a selected one of said cooking program cards; a cover member mounted on said card holder for movement between open and closed positions; a group of switches disposed within said card holder for selectively determining heating modes of said heating means of said cooking apparatus; and a plurality of through-holes formed in said cover at locations respectively corresponding to said switches so that said switches can be selectively accessed through the corresponding through-holes, each cooking program card being formed with through-holes of a size to permit said switches to extend therethrough at locations corresponding to the positions of those of said switches which are not to be actuated when the cooking program card placed in said card holder and is pressed against said group of the switches, while those of said switches located at positions corresponding to the portions of said cooking program card where said through-holes are not formed are caused to be actuated under the pressure exerted by said cooking program card upon closing of said cover member, each of said cooking program cards having a surface on which required information concerning the cooking process associated with said cooking program card is inscribed, said cover member having a portion enabling said information inscribed on the cooking program card inserted in said card holder to be viewed externally through said cover member, and at least a knob coupled to said heating means for adjustably setting a cooking temperature, said knob being adapted to be manually set in accordance with the information inscribed on the surface of the selected cooking program card inserted in said card holder.

---

**4,370,546**

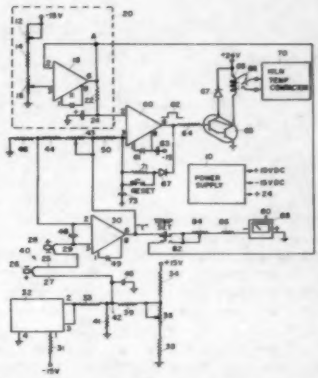
## KILN TEMPERATURE CONTROLLER

**Gene L. Warner, P.O. Box 604, Grand Haven, Mich. 49417**

**Filed Feb. 17, 1981, Ser. No. 234,873**

**Int. Cl.³ H05B 1/02**

**U.S. Cl. 219—497** **5 Claims**



1. A kiln temperature controller comprising:

circuit means for providing first signals representative of a selectable desired kiln temperature;

temperature detection means for providing second signals representative of the detected kiln temperature, said temperature detection means comprising:

a first thermocouple for insertion in a kiln for detecting the temperature within a kiln;

a second thermocouple coupled in series with said first thermocouple in opposite polarity thereto, with said second thermocouple positioned in the kiln temperature controller;

means for defining a heat sink disposed in the kiln temperature controller;

a solid state temperature sensing circuit in the kiln temperature controller, said temperature sensing circuit having a thermal connection to said means for defining a heat sink and said solid state temperature sensing circuit being coupled in series with said first and second thermocouples for providing an output signal having a polarity opposite that of said second thermocouple to nullify ambient temperature variations of the kiln temperature controller such that said temperature detection means provides an output signal accurately representing the detected kiln temperature;

said second thermocouple having a thermal connection to said means for defining a heat sink for providing said second thermocouple with an isothermal relationship with respect to said solid state temperature sensing circuit;

a solid state temperature compensated voltage source for said temperature sensing circuit;

said solid state temperature compensated voltage source being provided with an isothermal relationship with said solid state temperature sensing circuit and said solid state temperature compensated voltage source being provided with $V_{be}$ characteristics identical to the $V_{be}$ characteristics of said solid state temperature sensing circuit; and

comparator circuit means coupled to said circuit means and to said temperature detection means for providing control output signals employed for actuating a kiln to apply heat to the kiln when the detected kiln temperature is below the desired kiln temperature.

---

**4,370,547**

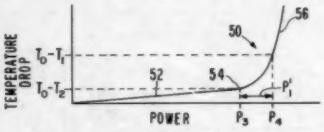
**VARIABLE THERMAL IMPEDANCE**

**Curtis E. Ward, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.**

**Continuation of Ser. No. 98,012, Nov. 28, 1979, which is a continuation of Ser. No. 901,937, May 1, 1978, abandoned. This application Apr. 16, 1981, Ser. No. 254,811**

**Int. Cl.³ H05B** *1/02*

**U.S. Cl. 219—497** **4 Claims**




1. A method of regulating the temperature of a heat source element which can be operated in a mode wherein heat is generated, comprising the steps of:

operating said element in said mode;

establishing a thermal connection via a heat pipe between said element and a heat sink for removing heat from said element, the relationship of the temperature difference between the ends of said heat pipe to the power-transfer through said heat pipe exhibiting a significantly more strongly non-linear characteristic in a high-power transfer region than in the lower power-transfer regions;

supplying heat from a control heater to said heat pipe in real time servo response to the temperature of said element; and

operating said heat pipe in a temperature gradient region which includes at least a portion of said high power-transfer region, the power level of said element being approximately within said high power-transfer region.

---

**4,370,548**

**ELECTRICAL HEATING ELEMENT**

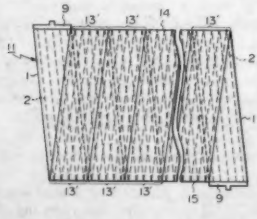
**Toshio Nagasawa, and Yoshio Nishihara, both of Kyoto, Japan, assignors to Ube Industries, Ltd., Tokyo, Japan**

**Filed Aug. 11, 1980, Ser. No. 177,447**

**Claims priority, application Japan, Aug. 14, 1979, 54-102792**

**Int. Cl.³ H05B** *3/36*

**U.S. Cl. 219—549** **8 Claims**




1. An electrical heating element of a sheet form comprising a rectangular web of a thermoplastic resin having a plurality of flexible metal conductor wires arranged therein in parallel to one another along the longitudinal direction of the web, said web being folded in succession at predetermined intervals along folding lines inclined at a small acute angle to the transverse direction of the web to form an essentially two-layer rectangular sheet.

---

**4,370,549**

**ELECTRONIC COUNTER CIRCUIT FOR TAPE RECORDER**

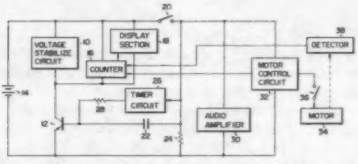
**Yoshio Tomizawa, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Apr. 2, 1980, Ser. No. 136,450**

**Claims priority, application Japan, Apr. 20, 1979, 54-52980**

**Int. Cl.³ G06M** *3/14*

**U.S. Cl. 235—92 MP** **5 Claims**




1. A tape recorder comprising:

a source of electrical power;

voltage stabilizing means coupled to said power source for stabilizing a voltage supplied from said power source;

counter means, power-supplied by said voltage stabilizing means, for indicating an amount of tape movement;

operating switch means coupled to said power source and which is selectively operable for selectively stopping movement of the tape of the tape recorder;

timer means responsive to operation of said operating switch means for stopping said movement of the tape for generating an inhibit signal upon the lapse of a predetermined time period after said operation of said operating switch means; and

switching means coupled between said power source and said voltage stabilizing means and further coupled to said timer means for electrically disconnecting said voltage stabilizing means from said power source responsive to said inhibit signal from said timer means.

---

**4,370,550**

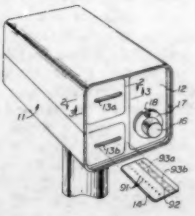
**DUAL READ-RECORD HEAD FOR MAGNETIC CARD MACHINE ACTUATOR**

**George B. Sidline, Belmont, Calif., assignor to Service Distributors, Inc., San Francisco, Calif.**

**Filed Oct. 29, 1980, Ser. No. 201,693**

**Int. Cl.³ G06K** *5/00*

**U.S. Cl. 235—449** **8 Claims**




1. A system for actuating apparatus external to said system

comprising a card having a longitudinal strip of magnetic material thereon encoded with two separate longitudinal tracks, a first said track being magnetically encoded with first signals indicating a number of potential uses of said card to actuate said apparatus, said second track being magnetically encoded with second signals comprising timing pulses spaced longitudinally along said second track at equidistant intervals,

a card reader comprising guide means shaped to receive said card, reversible drive means for driving said card in both directions longitudinally of said guide means, a read-write first head positioned to read said first track as it moves inward of said guide means and write on said first track as it moves outward of said guide means and a second read head positioned to read said second track as said card is driven in either direction by said drive means, a counter receiving said second signals from said second head at a rate proportional to the speed of movement of said card, a shift register storing said first signals on a time sequence as determined by said second signals, first means receiving signal from said shift register and emitting a third signal which is numerically one less than said first signal, second means for energizing said apparatus if said third signal is numerically at least one, said first head writing said third signal on said first track in timed relation as read on said second track by said second head,

a punch positioned to punch said card as said card travels outward of said guide means, electrical means for actuating said punch and a control for said electrical means energized dependent upon said counter so that, for each use of said card, said card is punched at a separate location.

---

**4,370,551**

## FOCUS DETECTING DEVICE

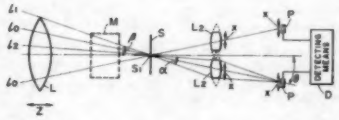
**Toru Fukuhara, Isehara, and Ken Utagawa, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Mar. 12, 1981, Ser. No. 242,886**

**Claims priority, application Japan, Mar. 18, 1980, 55-33383; Oct. 24, 1980, 55-150971**

**Int. Cl.³ G01J *1/20***

**U.S. Cl. 250—201** **3 Claims**




1. In a focus detecting device having an objective lens, a pair of re-imaging lenses for receiving the light imaged by said objective lens to form a first and a second image, respectively, a pair of focus detecting photoelectric converters disposed near the focal planes of said pair of re-imaging lenses, respectively, said pair of photoelectric converters being adapted to produce photoelectric outputs corresponding to the position changes of said first and second images caused on said photoelectric converters by movement of said objective lens in the direction of the optical axis, and detecting means for receiving the outputs from said pair of photoelectric converters and detecting whether or not said objective lens is in its in-focus condition, the improvement residing in that said pair of re-imaging lenses are provided so that the F-number of each re-imaging lens in a direction perpendicular to the direction of movement of the image formed thereby is smaller than the F-number of the same lens in the direction of movement of the same image position-changed on said photoelectric converters.

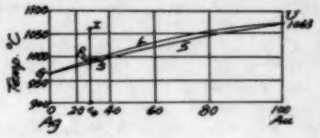
**4,370,552**

## METHOD FOR ORE PROSPECTING

**Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576**

**Filed Oct. 31, 1980, Ser. No. 202,706**

**Int. Cl.³ G01V *5/00***

**U.S. Cl. 250—253** **25 Claims**

1. A method for evaluating the size and value of an at least partially hidden, frozen ore body comprising:

locating a portion of said ore body;

determining the concentration values of a selected chemical element at two positions in said ore body;

measuring the distance between said two positions;

estimating the freezing segregation behavior of said selected element during the freezing of said ore body; and

from said determined concentration values, measured distance, and estimated freezing segregation behavior calculating the size of the still hidden portion of said ore body.

---

**4,370,553**

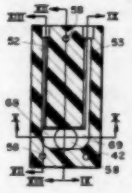
## CONTAMINATED SAMPLE GAS ANALYZER AND GAS CELL THEREFOR

**Roy A. Waycaster, Tecumseh; William T. Baker, Ann Arbor, and Jerry D. Bidle, Tecumseh, all of Mich., assignors to Sensors, Inc., Saline, Mich.**

**Filed Jul. 2, 1980, Ser. No. 165,250**

**Int. Cl.³ G01J *1/04***

**U.S. Cl. 250—343** **34 Claims**



1. A gas analyzer for performing gas analysis on a sample gas containing contaminants comprising:

a source of radiant energy;

means for directing radiant energy through a sample gas, the radiant energy being directed along a sample gas optical path;

a gas cell comprising a sample gas cell having a sample enclosure for containing a sample gas volume, a sample window means for defining a portion of said sample gas optical path extending through said sample gas volume, an inlet for supplying sample gas to said sample gas volume and an outlet for exhausting sample gas from said sample gas volume, said sample cell being provided with a flow pattern extending transversely with respect to said sample gas optical path, said flow pattern being defined by an inlet manifold interconnecting said inlet and said sample gas volume, said inlet manifold being provided with a roughly constant cross-sectional area, and an outlet manifold extending from said sample gas volume to said outlet, said outlet manifold being provided with a roughly constant cross-sectional area, the cross-sectional area of said outlet manifold being greater than the cross-sectional area of said inlet manifold, the cross-sectional area of said inlet

manifold being provided with a shape having roughly equilateral dimensions at said inlet to an elongate shape having a roughly uniform width at said sample volume, and the cross-sectional area of said outlet manifold being provided with an elongate shape having a roughly uniform width at said sample volume to a shape having roughly equilateral dimensions at said outlet, whereby turbulent flow and dead space in said sample gas volume is minimized;

a connector module for defining a channel for slidably receiving said gas cell and to provide for the periodic removal and replacement of said gas cell while maintaining the optical alignment of the gas analyzer;

detector means for receiving radiant energy from said sample gas optical path;

means for securing together in optical alignment said source, said means for directing radiant energy, said connector module and said detector; and

circuit means for analyzing the output of said detector and indicating the concentration of predetermined constituents of the sample gas.

---

**4,370,554**

## ALIGNMENT SYSTEM FOR PARTICLE BEAM LITHOGRAPHY

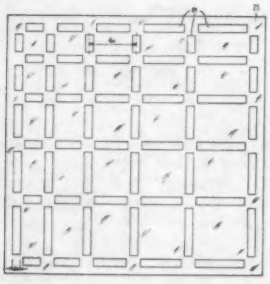
**Harald Bohlen, Boeblingen; Johann Greschner, Pliezhausen; Werner Kulcke, Boeblingen, and Peter Nehmiz, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 2, 1980, Ser. No. 183,118**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939044; European Pat. Off., Jun. 26, 1980, 80103603**

**Int. Cl.³ G01N *23/00***

**U.S. Cl. 250—491.1** **18 Claims**



1. In a particle beam projection system for exposing a substrate having alignment marks comprising an exposure mask in adjacent relation and close proximity to said substrate, at least one alignment grid in said exposure mask, the alignment grid consisting of a plurality of openings arranged in matrix-fashion, the center spacings of the openings in the alignment grid increasing upon advance in two directions perpendicular to each other in such a way that no distance can be represented by the sum of smaller distances, and said alignment grid forming partial beams from a particle beam whose interaction with said alignment marks of corresponding structure on the substrate forms an alignment signal for registering the mask and the substrate.

**4,370,555**

## DEVICE FOR STORING A SOURCE OF PHOTONS AND FOR IRRADIATING A BODY BY THE RADIATION FROM SAID SOURCE

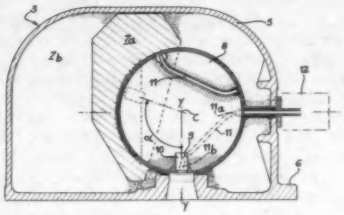
**Jean-Pierre Brethon, Orsay; Jean-Paul Guiho, Le Mesnil St. Denis; Gerard Taniel, Les Essarts le Roi, and Georges Viel, Orsay, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Societe CGR-MeV, Buc, both of, France**

**Filed May 14, 1980, Ser. No. 149,927**

**Claims priority, application France, Nov. 14, 1978, 78 32123**

**Int. Cl.³ G21F *5/02***

**U.S. Cl. 378—120** **9 Claims**



1. A photon storing and irradiation device having a radiation shielded body comprising a cylindrical container of circular cross section, having an axis (A), in said body; a disk housing located in said cylindrical container, dimensioned slightly smaller than that of said cylindrical container; a cylindrical gamma radiation containing housing in said disk, said housing having an opening on the periphery of the disk, with an axis perpendicular to axis (A) when the disk is rotated inside said body; said disk also containing a passage having an opening at one and the other of its ends at the periphery of the disk and capable of being located simultaneously opposite an optical device and a precollimator located in the walls of said cylindrical container and connected by an optical fiber, the ends of which, respectively called the receiver and emitter are located at right angles to each end of said passage via dismountable fixing means, and also having an optical device adjacent said body capable of producing a ray of light onto the receiver of said fiber; means for rotating said disk between a first position enabling said housing to irradiate a desired object for which the axis of said housing axis coincides with the axis (Y,Y) of the precollimator, and a second position for which said irradiation source is in a stored position while enabling the optical device by means of the optical fiber to produce a ray of light at the precollimator; and a part having an axis (Y,Y) perpendicular to axis (A) in the bottom of said body with said precollimator disposed at right angles to said port of axis (Y,Y).

---

**4,370,556**

## SELF-SUPPORTING MASK, METHOD FOR PRODUCTION AS WELL AS USE OF SAME

**Gerhard Stengl, Purkersdorf, and Hans Löschner, Vienna, both of Austria, assignors to Rudolf Sacher Gesellschaft m.b.H., Vienna, Austria**

**Filed Dec. 16, 1980, Ser. No. 217,064**

**Claims priority, application Austria, Dec. 27, 1979, 8153/79**

**Int. Cl.³ G01J *1/00***

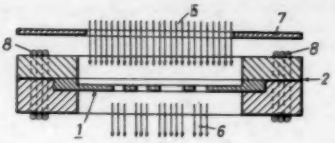
**U.S. Cl. 250—503.1** **17 Claims**

1. In a self-supporting mask for use in the treatment of substrates by irradiation or by a stream of particles constituting an image-forming medium having a mask foil fastened to a frame, the mask foil having at least one transparent region which is transparent to the image-forming medium, and a region which is opaque to the image-forming medium, the improvement wherein

said mask foil is thermally prestressed at a predetermined temperature of use by predetermined forces exerted by said frame on said mask foil, said mask foil and said frame

being at a predetermined assembly temperature level below said predetermined temperature of use when said mask foil and said frame are fastened together,

and wherein said mask foil and said frame are made of respectively different materials such that the coefficient of thermal expansion of the material of said frame is greater than the coefficient of thermal expansion of the material of said mask foil to permit said mask foil to remain thermally prestressed at the predetermined temperature of use.



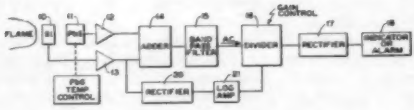

---

**4,370,557**

## DUAL DETECTOR FLAME SENSOR

**Roger E. Axmark, and Ernest A. Satren, both of Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Aug. 27, 1980, Ser. No. 181,580**
**Int. Cl.³ H05B 33/00**
**U.S. Cl. 250—554** **12 Claims**




1. In a multi-burner boiler installation of the type described, a flame monitoring system for a burner comprising:

first flame radiation sensing means responsive to a first radiation wavelength range, said first means providing a first electrical signal indicative of flame radiation sensed at said first wavelength range;

dissimilar flame radiation sensing means responsive to a different radiation wavelength range than said first means, said dissimilar means providing a second electrical signal indicative of flame radiation sensed at said different wavelength range;

a burner of said multi-burner installation for providing a proximate burner flame;

means positioning said first and said dissimilar sensing means to receive radiation from the proximate flame;

means for summing said first and second electrical signals from said sensing means;

filter means for passing the AC flicker components and filtering out the DC components of the summed signals to provide an AC output signal;

means for rectifying to DC said first electrical signal to provide a third signal;

non-linear amplifying means for compressing the dynamic range of said third signal which may vary in intensity by orders of magnitude at the input, to provide an output signal which is a function of the input signal but compressed in dynamic range;

divider means having a dividend input and a divisor input;

means connecting the compressed signal to the divisor input;

means connecting the AC output signal to the dividend input; and,

further means connecting the output of the divider means to indicator means.

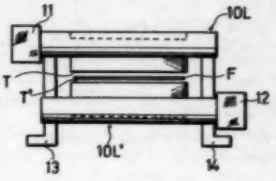
---

**4,370,558**

## FILM BLACKENING AREA MEASURING EQUIPMENT

**Minoru Kinoshita, Kyoto, and Masaji Mizuta, Uji, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan**

**Filed Apr. 13, 1981, Ser. No. 253,675**
**Claims priority, application Japan, Apr. 30, 1980, 55-058531**
**Int. Cl.³ G01N 21/59**
**U.S. Cl. 250—559** **2 Claims**




1. An apparatus for measuring film blackening area, having a detecting mechanism so composed to project light onto a film and to receive the light passed through the film by a receiver element, an amplification mechanism to amplify the output from the said receiver element, and a subtraction mechanism to subtract the amplified output from a reference signal, the difference between the said amplified output and the reference signal being calculated as a blackening signal to measure the blackening area of the film, comprising an amplification factor variable mechanism which is composed as the said amplification mechanism, and a comparator for comparing the output of the said amplification factor variable mechanism with the said reference signal, the output signal from the said comparator being supplied into the said amplification factor variable mechanism, the amplification factor being controlled depending on the magnitude of the said input signal and being fixed by a film insertion signal from a film feed mechanism.

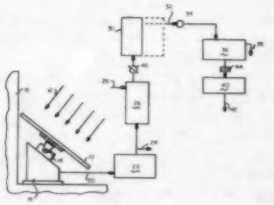
---

**4,370,559**

## SOLAR ENERGY SYSTEM

**David T. Langley, Jr., c/o 226 S. Main St., Los Angeles, Calif. 90012**

**Filed Dec. 1, 1980, Ser. No. 211,767**
**Int. Cl.³ H01L 31/04**
**U.S. Cl. 290—1 R** **2 Claims**



1. A solar energy apparatus, comprising, in combination:

(a) solar energy means for converting solar energy to electrical energy:

(b) conversion means operably connected to the solar energy means for converting to mechanical form an energy output of the solar energy means;

(c) energy storage means operably connected to the conversion means for storing energy in mechanical form received from the conversion means, and forming a potential energy storage facility permitting use of the energy at selected later times, the energy storage means including

elevatable, solid weight means for storing potential energy, and clutch means connected to the generator means for permitting the potential energy to be transferred from the weight means to the generator means by downward movement of the weight means, the energy storage means further including a chain connected to the weight means, and sprocket means arranged engaging the chain and operably connected to the generator means and conversion means for alternately moving the chain and being moved selectively by the chain in dependence on which of the generator means and conversion means is being operated, irregular movement of the chain by the sprocket means, through operation of the clutch means of the conversion means, elevating the weight means, and disengagement of the clutch means permitting the weight means to fall at a uniform rate and actuate the generator means; and

(d) generator means operably connected to the energy storage means for selectively converting energy stored in the energy storage means from mechanical form into electrical form.

---

**4,370,560**

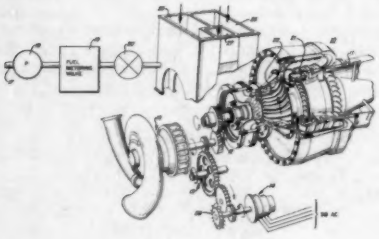
## COMPRESSOR LOAD CONTROL FOR AN AUXILIARY POWER UNIT

**Dennis T. Faulkner; Timothy F. Glennon, both of Rockford, and Albert L. Markunas, Roscoe, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Continuation of Ser. No. 85,121, Oct. 15, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 242,058**

**Int. Cl.³ H02P *9/04***

**U.S. Cl. 290—40 C** **3 Claims**



1. In an aircraft auxiliary power unit, having an engine, a generator driven by the engine, an air compressor driven by the engine, the speeds of the engine, air compressor and generator being directly related,

a fuel valve for the engine, and an engine control having means responsive to engine speed for controlling the fuel valve to maintain constant engine speed,

an improved transient engine speed control, comprising:

means for varying the loading of the air compressor on said engine; and

means responsive to the speed of one of the engine, generator or compressor for varying the compressor loading simultaneously with control of said fuel valve to minimize variation of the speed of the output frequency of the generator.

---

**4,370,561**

## VEHICLE MULTIPLEX SYSTEM

**George R. Briggs, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 28, 1980, Ser. No. 211,343**

**Int. Cl.³ G08C *15/12***

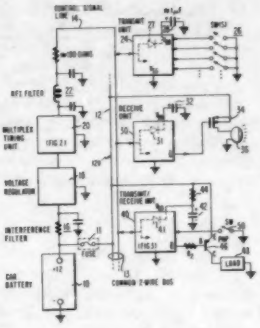
**U.S. Cl. 307—9** **10 Claims**

1. A vehicle multiplex system, comprising

a power conductor for conveying electrical power to power-operated units on the vehicle,

a signal conductor,

a multiplex timing unit for applying a tri-state timing waveform to said signal conductor, said waveform including a master timing interval followed by a plurality of sequential channel intervals, each channel interval including a control time period during which the timing unit allows the voltage on the signal conductor to float,



a plurality of control signal transmitters each operative in response to a physical command to apply a corresponding control signal to the signal conductor during a control time period in a channel interval assigned to the transmitter, and

a plurality of control signal receivers each operative to control the connection of electrical power from the power conductor to a power-operated unit in response to a control signal received from the signal conductor during a control time period in a channel interval assigned to the receiver.

---

**4,370,562**

## ELECTRIC POWER DISTRIBUTION SYSTEM

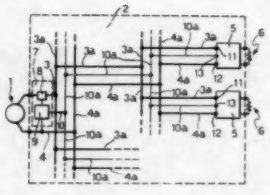
**Mario Palazzetti, and Gianfranco Salotti, both of Avigliana, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy**

**Filed Feb. 25, 1981, Ser. No. 237,823**

**Claims priority, application Italy, Mar. 11, 1980, 67378 A/80**

**Int. Cl.³ H02J *3/14***

**U.S. Cl. 307—38** **5 Claims**



1. An electric power distribution system comprising:

two power supply conductors;

a plurality of power outlet units connected to said two supply conductors whereby to enable the connection to the system of a corresponding plurality of electrical loads;

control conductor means;

a control unit connected by said control conductor means to each said power outlet unit and adapted:

(a) to carry out, at the moment of connection of a said load to a said power outlet unit, a measurement indicative of the increase in power which would need to be supplied by the system to power this load, this measurement being

effected in such a manner as to avoid appreciable overloading of the system;

(b) to effect a comparison of the result of said measurement with a measure of the additional power suppliable by the system, and

(c) to provide a comparison-indicative signal indicative of the result of said comparison;

each said power outlet unit including a switching arrangement having two operational states, in the first of which the connection of a said load to said power outlet unit results in the load being inserted between said control conductor means and one of the said supply conductors whereby to enable the control unit to carry out said measurement for that load and effect said comparison, and in the second of which the said switching arrangement connects the load across the two said supply conductors; change over from said first to said second state occurring only when the comparison-indicative signal provided by the control unit indicates that the power required for the operation of this load will not result in the maximum power suppliable by the system being exceeded,

said control conductor means include a primary control conductor emanating from said control unit and a plurality of further control conductors branching from said primary control conductor and each connected to a respective said power outlet unit, and each said power outlet unit comprising:

first and second input terminals connected respectively to said first and second power supply conductors of the distribution system;

a third input terminal connected to the corresponding said further control conductor;

first and second output terminals to which, in use, an electrical load can be connected;

first and second fixed electrical contacts;

a relay including an excitation winding and a movable contact member, said movable contact member being connected to the said first output terminal and being movable between a working position and a rest position in which it is in contact, respectively, with said first and second contacts, and the said excitation coil of the relay being connected between the third input terminal and the said second contact, and

a hold-on coil connected between said first input terminal and said first fixed contact and operative to maintain the said movable contact member in its working position for the entire period of time during which a said load connected to the power outlet unit is supplied by the said electric power distribution system.

---

**4,370,563**

**METHOD OF AND APPARATUS FOR LOAD AND/OR LOAD CONTROL SIGNALING TO CUSTOMERS IN A POWER SYSTEM**

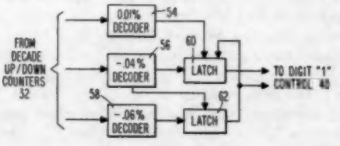
**John M. Vandling, deceased, late of Pleasantville, N.Y., and Patricia Vandling, executrix, Hoanjovo La., Pleasantville, N.Y. 10570**

**Continuation-in-part of Ser. No. 856,757, Dec. 2, 1977, Pat. No. 4,246,492. This application Dec. 24, 1980, Ser. No. 219,985**

**The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.**

**Int. Cl.³ H02J *13/00***

**U.S. Cl. 307—40** **29 Claims**




1. Apparatus for use in a power generating system wherein power is transmitted at a nominal standard frequency, the frequency is controllably varied from said nominal standard to signal load and/or load control information, and the frequency is also varied without signaling load and/or load control information, said apparatus comprising:

detector means for detecting variations in frequency signaling load and/or load control information while ignoring other frequency variations; and

load signal means coupled to said detector means for signaling a detected variation in frequency.

---

**4,370,564**

**AC SWITCHING DEVICE**

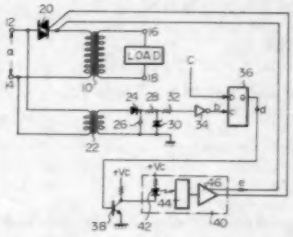
**Yoh Matsushita, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed May 28, 1981, Ser. No. 267,931**

**Claims priority, application Japan, Jun. 4, 1980, 55-74163; Jun. 4, 1980, 55-74164**

**Int. Cl.³ H04B *3/54*; H01H *9/54***

**U.S. Cl. 307—140** **10 Claims**




1. An AC switching device comprising:

a transformer consisting a primary winding to be connected to an AC power source and a secondary winding to be connected to a load, said load producing a turn-on command signal and a turn-off command signal;

a switching element connected to the transformer at the primary winding for turning on and off an alternating current from the AC power source;

zero-crossing point detecting means connected to the transformer at the primary winding for detecting a zero-crossing point where the alternating current shifts from a predetermined one of positive and negative phases to the other to produce a zero-crossing point detection signal; and

control means responsive to the turn-on and turn-off command signals to control the switching element to be turned on and off respectively always at said zero-crossing point in synchronism with the zero-crossing point detection signal.

---

**4,370,565**

**TIMED ELECTRIC SWITCH**

**Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio**

**Division of Ser. No. 967,923, Dec. 11, 1978, Pat. No. 4,276,483. This application Oct. 27, 1980, Ser. No. 200,856**

**Claims priority, application Canada, Aug. 21, 1978, 301690**

**The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.**

**Int. Cl.³ H01H *43/24***

**U.S. Cl. 307—141** **5 Claims**

1. A timed switch for an electric load which comprises

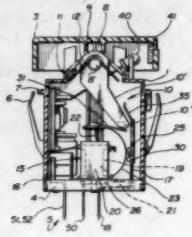
a housing,

relay means mounted within said housing, said relay means including a pair of relay contacts for series connection with said load, movable relay core means connected to at least one of said contacts and relay holding means which

when activated exert a holding force on said movable core means to hold said contacts in a closed condition and which when deactivated release said core means to release said contacts to an opened condition,

a timer circuit mounted within said housing,

manually actuable means carried by said housing for moving said contacts to the closed condition, said timer circuit being activated in response to the closing of said contacts by said manually actuable means, said relay holding means being activated in response to the closing of said contacts by said manually actuable means to exert the holding force



on said core means and to hold said contacts in the closed condition,

means interconnecting said timer circuit and said relay holding means for deactivating said relay holding means to release said core means and to release said contacts to the opened condition upon expiry of a predetermined time period measured by said timer circuit,

said manually actuable means also including means for physically moving said contacts to the opened condition upon manual actuation thereof without having to overcome the holding force of said relay holding means on said core means.

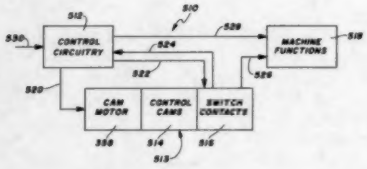
---

**4,370,566**

## APPLIANCE CONTROL SYSTEM

**Leroy A. Perry, Danville, and Charles E. Scott, Noblesville, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.**

**Filed Apr. 15, 1981, Ser. No. 254,377**
**Int. Cl.³ H01H *43/00***
**U.S. Cl. 307—141** **15 Claims**




1. A control system for an appliance having a plurality of different operational cycles, comprising:

cam operated switch means for controlling the coupling of electrical power to the appliance, said switch means including a plurality of rotatable cams for operating said switch means in response to the rotational position of said cams, said switch means being adapted for electrical rotation of said cams;

digital electronic control circuit means for controlling said electrical rotation, said control circuit means including means for receiving a selection of any one of said cycles for the operation of said appliance; and

second circuit means coupled between said switch means and said control circuit means and responsive to said means for receiving for supplying information on the rotational position of said cams to said control circuit means to enable control of said electrical rotation in accordance with a cycle selection.

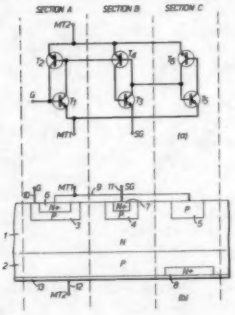
---

**4,370,567**

## SEMICONDUCTOR SWITCH DEVICE SUITABLE FOR A.C. POWER CONTROL

**Anthony Lear, Huntingdon, England, assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 21, 1980, Ser. No. 179,574**
**Claims priority, application United Kingdom, Aug. 22, 1979, 7929184**
**Int. Cl.³ H03K *17/72***
**U.S. Cl. 307—252 T** **23 Claims**



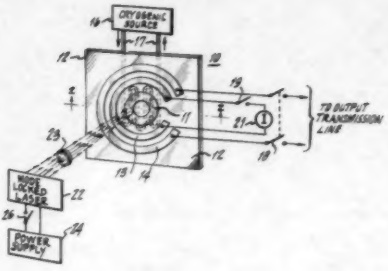

1. A semiconductor switch device including a thyristor structure having first, second and third four-layer semiconductor switch components formed in the same semiconductor body; said semiconductor body comprising a first continuous layer of a first conductivity type in overlying relationship with a second continuous layer of a second conductivity type opposite from that of said first conductivity type, said first and second layers providing opposite major surfaces of said semiconductor body; said first switch component having a first region of the second conductivity type in said first layer and forming a first gate of the switch device, and a second region of the first conductivity type in said first region; said second switch component having a third region of the conductivity type in said first layer and a fourth region disposed in the second layer opposite the third region and having the first conductivity type; said third semiconductor switch component having a fifth region of the second conductivity type in said first layer and a sixth region of the first conductivity type in at least one of said first and second layers, said third switch component electrically coupled through the semiconductor body to the first and second switch components; each of said switch components having one end electrode at said first major surface and another end electrode at said opposite major surface; connection means for joining the second and third regions to form a first main terminal of the switch device; conductive means connecting surface areas of the second layer opposite the first and fifth regions to said fourth region, said conductive means forming a second main terminal of the switch device and an end terminal contact to one of said fifth and sixth regions providing a second gate for the switch device.

**4,370,568**

## SUPERCONDUCTING, FAST RISE-TIME VOLTAGE SOURCE

**Robert M. Lumley, Lawrence Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed Dec. 10, 1979, Ser. No. 102,076**
**Int. Cl.³ H03K *3/38***
**U.S. Cl. 307—260** **6 Claims**




1. Apparatus for generating an electrical pulse having an extremely short rise-time comprising:
an electrically conducting toroid;
means for cooling said toroid to approximately absolute zero, whereupon said toroid becomes superconducting;
means, magnetically coupled to said toroid, for inducing a perpetually circulating current in said toroid;
means for heating a portion of said toroid to a temperature above the critical temperature thereof; and
means, magnetically coupled to said toroid, for sensing the abrupt drop in the circulating current that occurs therein when said critical temperature is exceeded, wherein said toroid, said current inducing means, and said current sensing means comprise coplanar, coaxial, thin metallic films deposited on a substrate.

---

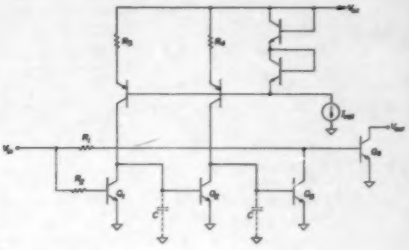
**4,370,569**

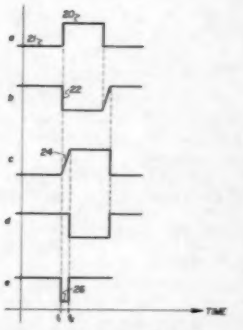
## INTEGRATABLE SINGLE PULSE CIRCUIT

**Dan M. Hunsinger, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Oct. 30, 1980, Ser. No. 202,279**
**Int. Cl.³ H03K *5/06, 5/153***
**U.S. Cl. 307—266** **1 Claim**

1. A circuit for generating a single pulse in response to an applied trigger having a width greater than the generated single pulse comprising:
an input port for receiving an applied input trigger;
an output port coupled to said input port for providing a single pulse having a select width in response to said input trigger, said output port comprising a first transistor having its base coupled to said input port and its collector uncoupled for connection to an external connection;
timing means coupled to said input port for delaying said input trigger by a select time t, said timing means comprising
(a) a second and a third transistor, said second transistor having its base coupled to said input port and its collector coupled to a first temperature compensated capacitor and to the base of said third transistor, and
said third transistor having a collector coupled to a second temperature compensated capacitor and to said shunt means, and
(b) two temperature compensated current sources having
a fifth transistor having its collector coupled to said second transistor collector and its emitter coupled to a first resistor,
a sixth transistor having its collector coupled to said third transistor collector and its emitter coupled to a second resistor,
a first diode means coupled to an input of a second diode means, and
a rail current source coupled to the output of said second diode means and to the base of said fifth transistor and to the base of said sixth transistor, thereby said timing means is independent of temperature; and






shunt means coupled to said output port for truncating said input trigger in response to said input trigger delayed by t applied thereto to provide said single pulse, said shunt means comprising a fourth transistor having its base coupled to the collector of said third transistor and its collector coupled to the base of said first transistor.

---

**4,370,570**

## CIRCUIT FOR MINIMIZING RADIATION

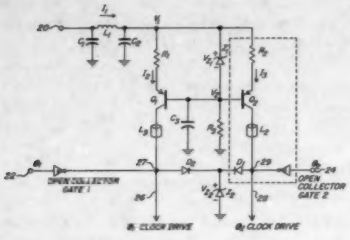
**Glen R. Dash, 16 Pierce Rd., Watertown, Mass. 02172, and Isidor Straus, 2 Ridgewood Rd., Malden, Mass. 02148**

**Filed Nov. 24, 1980, Ser. No. 209,331**
**Int. Cl.³ H03K *3/01, 3/33***
**U.S. Cl. 307—270** **4 Claims**

1. A clock driver circuit comprising;
a pair of bipolar transistors each having base, emitter and collector electrodes,
means coupling the base electrodes at common base node,
a pair of current determining resistors one associated with each bipolar transistor,
means defining an input power terminal to which a DC voltage is applied,
passive conducting means coupling the power terminal to each resistor with the resistor coupled in turn to one of the emitter and collector electrodes,
first and second gates having outputs coupling respectively to define first and second clock drive lines,
passive conductive means coupling the other of the emitter

and collector electrodes to the respective first and second clock drive lines,

a first Zener diode and a pair of diodes coupled respectively to the gate outputs,



and a second Zener diode coupled from the common base node to a common connection of the resistors.

---

**4,370,571**

**RELAY DEVICE**

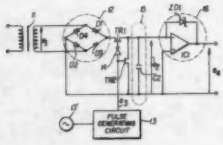
**Fumio Andow, Hachioji, and Norio Fujisawa, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan**

**Filed Jan. 4, 1980, Ser. No. 109,552**

**Claims priority, application Japan, Mar. 20, 1979, 54/31680**

**Int. Cl.³ G11C *27/02***

**U.S. Cl. 307—353** **20 Claims**



1. A relay device comprising:

a rectifying circuit which rectifies an input AC electric quantity and produces a rectified output quantity;

holding means connected to the rectifying circuit for holding the peak value of the rectified output quantity of the rectifying circuit;

resetting means connected between the rectifying circuit and the holding means for resetting to a predetermined first level the held peak value of the holding means, said resetting means including a switching element connected to said holding means;

pulse generating means connected to the switching element for generating pulses to drive said switching element; and

detecting means having an input coupled to the holding means for detecting the held peak value of the holding means and for producing an output at a predetermined second level if said held peak value exceeds a predetermined threshold voltage level, comprising

an operational amplifier; and

a zener diode connected between the input and the output terminals of the operational amplifier, said operation amplifier being coupled to the output of said holding means.

**4,370,572**

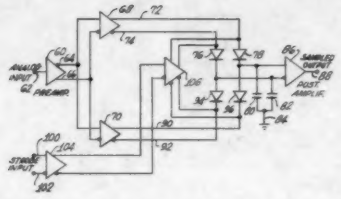
**DIFFERENTIAL SAMPLE-AND-HOLD CIRCUIT**

**Albert E. Cosand, Agoura, and Kenneth B. de Graaf, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.**

**Filed Jan. 17, 1980, Ser. No. 112,963**

**Int. Cl.³ G11C *27/02***

**U.S. Cl. 307—353** **8 Claims**



1. A monolithic differential sample-and-hold circuit, comprising:

a preamplifier for processing an analog input signal and providing corresponding differential analog signals;

a first differential amplifier connected to receive the analog signals from said preamplifier to provide a first amplified differential analog signal;

a second differential amplifier also connected to receive the analog signals from said preamplifier, to provide a second amplified differential analog signal identical to said first amplified differential analog signal;

two capacitors, each having a grounded terminal and an ungrounded terminal;

a first pair of diodes having anode terminals connected to receive said first amplified differential analog signal, and cathode terminals each connected to said ungrounded terminal of a different one of said capacitors;

a second pair of diodes having cathode terminals connected to receive said second differential analog signal and anode terminals connected to corresponding cathode terminals of said first pair of diodes;

a post-amplifier having differential inputs connected to said ungrounded terminals of said capacitors; and

a bias signal source connectable to said first and second pairs of diodes to provide forward bias in response to a tracking-mode signal and reverse bias in response to a hold-mode signal;

whereby said first and second pairs of diodes are forward-biased in response to the tracking-mode signal, to allow said first and second amplified differential analog signals to be coupled through said first and second pairs of diodes to said capacitors, and are reverse-biased in response to the hold-mode signal, to isolate said capacitors from said analog signals.

---

**4,370,573**

**WAVE FORM TRANSITION SEQUENCE DETECTOR**

**Bruce C. Keene, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Nov. 28, 1980, Ser. No. 210,950**

**Int. Cl.³ H03K *5/26***

**U.S. Cl. 307—514** **3 Claims**

1. Apparatus for determining the relative order of occurrence of a transition from a first to a second state between a first and a second input wave form signal, said apparatus comprising:

a first switching transistor means having base, emitter and collector electrodes;

a second switching transistor means having base, emitter and collector electrodes;

means connecting said collection of said first transistor means to said base electrode of said second transistor means and means connecting said collector of said second

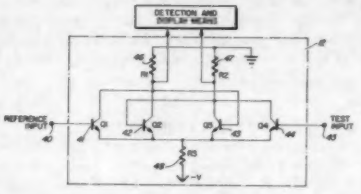
transistor means to said base electrode of said first transistor means;

a third and a fourth transistor means, each having base, emitter and collector electrodes;

means connecting said collector of said third transistor means to said collector of said first transistor means and, through a first load resistor, to a first common point fixed reference potential;

means connecting said collector of said fourth transistor means to said collector of said second transistor means and, through a second load resistor, to said first common point;

means connecting said emitters of said first, second, third and fourth transistor means together and, through a com-




mon emitter resistor, to a second common point of reference potential;

means coupling said first input wave form signal to said base electrode of said third transistor means and means coupling said second input wave form signal to said base electrode of said fourth transistor means;

differential output signal means connected, respectively, to said collectors of said first and second transistor means; and

detector means connected to said output signal means for determining the relative polarity of the differential output signal as an indication of said relative order of occurrence a transition of state between said first and second wave form signal.

---

**4,370,574**

## DETECTOR FOR TIME DIFFERENCE BETWEEN TRANSITIONS IN TWO WAVE FORMS

**Raymond E. Nielsen, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Nov. 28, 1980, Ser. No. 211,162**
**Int. Cl.³ H03K *5/26***
**U.S. Cl. 307—514** **4 Claims**

1. Apparatus for determining the relative order of occurrence of transitions in signal level state in a first and a second wave form signal; and for determining time difference therebetween, said apparatus comprising:

a pair of transistor means cross-coupled to provide a bistable transistor unit;

a third transistor connected to selectively provide a short-circuit path across one transistor of said pair;

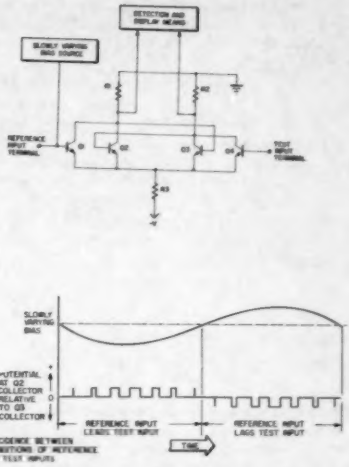
said third and fourth transistors each having a control electrode to control the respective short-circuit paths;

means coupling said first input wave form signal to said control electrode of said third transistor and means coupling said second input wave form signal to said control electrode of said fourth transistor to control the selective actuation of said respective short-circuit paths, said short circuit paths, when actuated, inhibiting the bistable actuation of said bistable transistor unit;

said bistable transistor unit being triggered to one or the other of its bistable states depending upon which of said input wave form signals first undergoes a transition to block said short-circuit path associated therewith, such triggering occurring on each cyclic transition of said wave form signals;

bias signal means providing a bias signal, said bias signal being symmetrical about a zero value and varying slowly with respect to said first and second input wave form signal;

means coupling said bias signal means to superimpose said bias signal on said first input wave form signal at said control electrode of said third transistor time shifting the triggering base level of said third transistor in accordance with the instantaneous level of said bias signal thereby




producing positive output signals during one part of said symmetrical bias signal and negative output signals during the remainder of said symmetrical bias signal; and

means connected to said bistable transistor unit to detect the ratio of said positive and negative signals as a function of the order of occurrence of said transitions in said first and second wave form signals and the time difference therebetween.

---

**4,370,575**

## HIGH PERFORMANCE DYNAMIC SENSE AMPLIFIER WITH ACTIVE LOADS

**Joseph C. McAlexander, III, Sugar Land; Lionel S. White, Jr., and G. R. Mohan Rao, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 944,822, Sep. 22, 1978, Pat. No. 4,239,993. This application Oct. 14, 1980, Ser. No. 196,987**
**Int. Cl.³ H03K *5/24*; G11C *7/06***
**U.S. Cl. 307—530** **10 Claims**

1. A sense amplifier for a semiconductor memory device of the type having an array of rows and columns of memory cells with each column split into two column line halves and sense amplifiers connected to pairs of sense nodes at ends of each pair of column line halves, each sense amplifier comprising:

a pair of cross-coupled driver transistors, a pair of coupling transistors, a pair of grounding transistors and a pair of pull-up transistors, each of the transistors having a current path and a control electrode,

means connecting the current path of each of the coupling transistors in series with the current path of a separate one of the driver transistors between one of the sense nodes and a grounding node and connecting the current paths of both of the grounding transistors in parallel between the grounding node and reference potential,

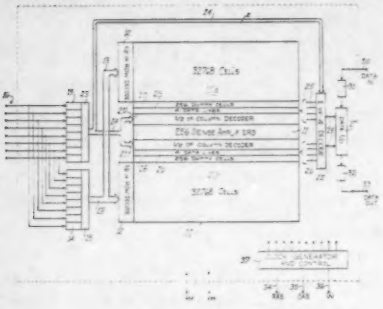
the current paths of the pull-up transistors being connected separately between the sense nodes and a supply voltage,

means for precharging the sense nodes prior to an active operating cycle,

means for addressing a selected row of the memory cells in the array at a first time in the beginning of said operating cycle,

means for maintaining the voltage on the control electrodes of the coupling transistors at a level to render the current paths highly conductive prior to said first time,

means for applying a clock voltage to turn on one of the grounding transistors at a second time subsequent to the said first time in the beginning of an active operating cycle and for applying another clock voltage to turn on the other of the grounding transistors at a third time subsequent to the second time, said one of the grounding transistors being much smaller than the other of the grounding transistors,



coupling means separately connecting the control electrodes of the pull-up transistors to the sense nodes, the coupling means being conductive only for a given voltage differential during the active operating cycle,

clock means to boost the voltage on the control electrode of one of the pull-up transistors higher at a fourth time in the active operating cycle just following the third time,

means to shift the voltage on the control electrodes of the coupling transistors from a higher level at about said first time prior to the beginning of active operating cycle to a lower level during the active operating cycle.

---

**4,370,576**

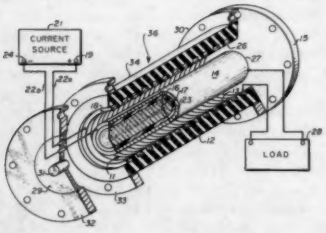
## ELECTRIC GENERATOR

**John S. Foster, Jr., Pleasanton; James R. Wilson, Livermore, and Charles A. McDonald, Jr., Danville, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 21, 1962, Ser. No. 175,393**

**Int. Cl.³ H02K *1/00*; G21B *1/00*; G01R *33/02***

**U.S. Cl. 310—10** **14 Claims**




1. In an electrical energy generator, the combination comprising a first elongated annular electrical current conductor having at least one bare surface extending longitudinally and facing radially inwards therein, a second elongated annular electrical current conductor disposed coaxially within said first conductor and having an outer bare surface area extending longitudinally and facing said bare surface of said first conductor, the contiguous coaxial areas of said first and second conductors defining an inductive element, means for applying an electrical current to at least one of said conductors for generating a magnetic field encompassing said inductive element, and explosive charge means disposed concentrically with respect to said conductors including at least the area of said inductive element, said explosive charge means including means disposed to initiate an explosive wave front in said explosive advancing longitudinally along said inductive element, said wave front being effective to progressively deform at least one of said conductors to bring said bare surfaces thereof into electrically conductive contact to progressively reduce the inductance of the inductive element defined by said conductors and transferring explosive energy to said magnetic field effective to generate an electrical potential between undeformed portions of said conductors ahead of said explosive wave front.

---

**4,370,577**

## LINEAR MOTOR

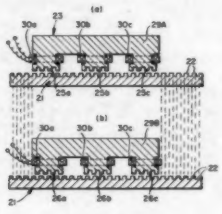
**Noriaki Wakabayashi; Terumichi Fukumoto, both of Hirakata, and Nobuhiro Ueda, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jul. 17, 1981, Ser. No. 284,564**

**Claims priority, application Japan, Jul. 22, 1980, 55-100691**

**Int. Cl.³ H02K *41/00***

**U.S. Cl. 310—12** **1 Claim**



1. A linear motor comprising: a stator along which many magnetic teeth are formed with a constant pitch; a mover which faces said stator across a narrow gap and has the same magnetic teeth as that of the stator; and a mover guiding means which guides the mover smoothly along the stator while maintaining said narrow gap; wherein the mover comprises: a permanent magnet which is long in the longitudinal direction of the stator; two cores which are stacked perpendicularly to the longitudinal direction of the stator with said permanent magnet between them; and a plurality of coils, each of which is wound over said two cores and said permanent magnet and has a magnetization axis which is perpendicular to the longitudinal direction of the stator, wherein each of said two cores has n groups (wherein n is an integer) of magnetic teeth facing the stator, and wherein in each of said n groups of magnet teeth, the pitch of a tooth is constant and is the same as that of the magnetic teeth of the stator, but wherein in each core, the phases of the magnetic teeth of each group are different from each other.

---

**4,370,578**

## COIL/CORE ASSEMBLY WITH INTERFERENCE FIT

**Wilhelm K. P. H. Tilse, Birkenfeld, Fed. Rep. of Germany, assignor to Timex Corporation, Waterbury, Conn.**

**Filed Jun. 18, 1981, Ser. No. 274,850**

**Int. Cl.³ H02K *15/08***

**U.S. Cl. 310—42** **4 Claims**

1. A coil/core assembly for a stepping motor comprising an elongated coil formed of a plurality of wound turns of wire

with inner turns of wire defining a longitudinal bore through the coil, and comprising a pair of flat core members, each having a long portion disposed in the bore and a short portion extending at right angles thereto disposed outside the bore, said long portions extending through the bore in opposite directions from their respective short portions with inner sides in intimate contact with one another and with outer sides facing

the inner turns of the coil, the outer side of the long portion of each core member having an outwardly extending, coil-engaging bump projecting from the end thereof near its respective short portion in interference fit with the inner turns of the coil near opposite ends of the bore, whereby the core members are held in contact together and to the coil by interference fit in the bore when said long portions of the core members are fully inserted into the bore.

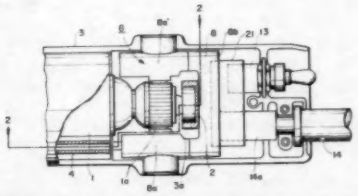
---

**4,370,579**

## POWER TOOL HAVING A PRINTED CIRCUIT BOARD

**Jyuro Kobayashi; Masanori Ito, and Hiroyasu Ishikawa, all of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan**

**Filed Sep. 25, 1981, Ser. No. 305,778**
**Claims priority, application Japan, Sep. 26, 1980, 55-134778**
**Int. Cl.³ H02K *5/14, 7/14***
**U.S. Cl. 310—50** **6 Claims**



1. A power tool having, within a housing, a stator including a pair of stator coils and a plurality of stator terminals connected to said stator coils, a rotor having a commutator rotatably mounted with respect to the stator, a switch having a pair of terminals and a power cable end block having a pair of terminals, comprising within said housing:

a brush holder assembly including pair of transversely spaced apart, axially extending parallel blocks of insulative material each holding a brush and a pair of conductors extending parallel therethrough, each of said conductors including a terminal at one end thereof for connection with an associated one of said stator terminals, said parallel blocks being connected together by a web member so that each brush is brought into contact with said commutator,

an electrical circuit board located adjacent to the web member of said brush holder assembly remote from said stator; and

a positioning member of insulative material adjacent to said printed circuit board remote from said brush holder assembly for positioning the terminals of said switch and power cable end block in contact with said printed circuit board;

said electrical circuit board including a circuit pattern which permits the terminals of said switch and power cable end block to be mutually connected and further electrically connected to the conductors of said brush holder assembly so that said stator coils; commutator, brushes and switch are connected in a series circuit with said power terminals.

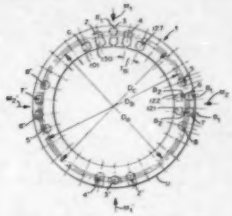
---

**4,370,580**

## RELUCTANCE MOTOR

**Martin Burgbacher, St. Georgen, Fed. Rep. of Germany, assignor to Papst Motoren GmbH und Co. KG, St. Georgen, Fed. Rep. of Germany**

**Filed Jun. 12, 1980, Ser. No. 158,982**
**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925392**
**Int. Cl.³ H02K *19/14***
**U.S. Cl. 310—67 R** **6 Claims**



1. A reluctance motor comprising:

a stator comprising

a plurality of poles,

a winding with at least one coil for each pole and a phase combination providing a rotary magnetic field,

a squirrel cage rotor comprising

a plurality of pole portions, each having respective pole ends, a pole span between said ends and a pole middle,

a plurality of flux path portions extending towards the air-gap side of the rotor between the rotor slots, wherein a region corresponding to a fraction from about 0.2 to 0.6 of the range corresponding to a pole pitch around the pole middle is provided with yoke-reducing, non-magnetic portions which are aligned with the slots of the rotor, said portions varying in their magnetic structure between pole portions subsequent on the circumference of the rotor.

---

**4,370,581**

## MULTILAYERED COIL STRUCTURE

**Yoshimitsu Nakamura, Settsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan**

**Continuation of Ser. No. 945,836, Sep. 26, 1978, abandoned. This application Jun. 11, 1980, Ser. No. 158,497**
**Claims priority, application Japan, Sep. 30, 1977, 52-118125**
**Int. Cl.³ H02K *3/00***
**U.S. Cl. 310—198** **6 Claims**

1. A cylindrically-shaped multilayered coil structure for use in coreless motors, comprising more than two coil sections each having a width equal to the circumference of the cylindrical coil structure divided by the number of coil sections, each coil section including at least inner and outer coil layers ex-

tending diagonally between opposite axial ends of the cylindrical coil structure, each such layer including a plurality of turns of a coil wire which extend diagonally completely around the circumference and forming an initial turn and a final turn, the initial and final turns of each outer layer being disposed adjacent to said initial and final turns, respectively, of the inner layer of the same coil section, each coil section including a crossing part interconnecting the final turn of the inner layer with the initial turn of the outer layer, each crossing part being of one integral piece and being continuous and unbroken from the final turn of the associated inner layer to the initial turn of the associated outer layer, each crossing part disposed axially inwardly of the axial end at which it is located, and being positioned in between the associated inner and outer layers.

---

**4,370,582**

## AXIAL GAP SQUIRREL CAGE INDUCTION ELECTRIC MOTOR

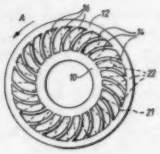
**Roy W. Addicott, Burnham-on-Sea, and Bernard Capaldi, Woolavington, both of England, assignors to Sealed Motor Construction Company, Limited, England**

**Filed Oct. 9, 1980, Ser. No. 195,436**

**Claims priority, application United Kingdom, Oct. 18, 1979, 7936228**

**Int. Cl.³ H02K** *3/06*

**U.S. Cl. 310—211** **3 Claims**



1. An axial gap squirrel cage induction motor comprising an annular stator presenting an annular face, and a rotor presenting a face towards said annular face of the stator, said stator and rotor faces defining between them an axial gap; the stator comprising an annular core of magnetic material and having radial slots formed in the annular face of the core adjacent the axial gap, in which radial slots are located energizing windings for the stator, whereby said face of the stator presents a series of regions of alternately magnetic and non-magnetic material provided respectively by the unslotted portions of the stator core and the material of the energizing windings located in the slots; the rotor comprising a magnetic component and a non-magnetic conductive component, the non-magnetic conductive component comprising radially inner and outer rings joined by a series of bars spaced apart to define interstitial regions there between, the magnetic component occupying said interstitial regions, whereby the rotor between said rings has directly opposite said face of the stator adjacent the axial gap an annular portion formed of a series of alternately non-magnetic and magnetic material provided respectively by said bars and said interstitial magnetic material; said bars of the rotor following a curved path between the inner and outer conductive rings, the direction of the bars having a higher radial component at their radially inner end than at their radially outer end such that the curved conductive bars of the rotor do not register with the radial slots in the stator when viewed in the axial direction.

**4,370,583**

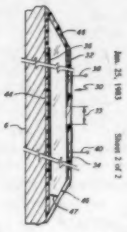
## PIEZOELECTRIC MOTOR FOR DITHERING RING LASER GYROSCOPES

**Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.**

**Filed Jan. 16, 1981, Ser. No. 225,490**

**Int. Cl.³ H01L** *41/08*

**U.S. Cl. 310—331** **7 Claims**



1. In a drive motor for dithering a ring laser gyroscope having a hub, a movable outer rim, at least one elongate, flexible spoke connecting the hub to the outer rim, and at least one transducer attached to the spoke for deflecting the spoke, the improvement comprising:

the transducer consisting of a piezoelectric element having a single electrode on the side of the element which is attached to the spoke, and a pair of electrodes on the opposite side, one electrode of the pair located nearer to the hub and the other located nearer to the rim; and

means for applying a drive voltage to only the pair of electrodes.

---

**4,370,584**

## ELECTRODE CONFIGURATION FOR THICKNESS-SHEAR MODE PIEZOELECTRIC VIBRATOR

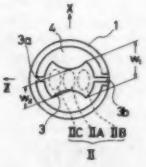
**Hitoshi Ikeno; Tetsuro Konno; Mitsuyuki Sugita, and Hirofumi Yanagi, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan**

**Filed Mar. 10, 1980, Ser. No. 128,952**

**Claims priority, application Japan, Mar. 12, 1979, 54-28417**

**Int. Cl.³ H01L** *41/08*

**U.S. Cl. 310—365** **17 Claims**



1. A thickness-shear mode piezoelectric vibrator comprising: a thickness-shear mode piezoelectric piece having opposite major surfaces and vibratable in a fundamental main vibration mode and spurious vibration modes; and driving electrodes disposed on said opposite major surfaces of said piezoelectric piece for driving said piezoelectric piece in the fundamental main vibration mode, one of said driving electrodes being disposed on one of said major surfaces and overlying the center portion thereof at a location where electric charge concentrates during the fundamental main vibration, and the other of said driving electrodes being disposed on the other of said major surfaces and overlying portions thereof at a location other than where electric charge concentrates during at least

one spurious mode vibration, said other driving electrode being configured to define an electrode-free region where said other major surface is free of and not covered by said other driving electrode, said electrode-free region having a center region located where electric charge concentrates during the fundamental main vibration and two side regions one on either side of the center region in the direction of the Z axis of the piezoelectric piece at locations where components of electric charge concentrate during said one spurious vibration, the two side regions being wider than the center region in the direction of the X axis of the piezoelectric piece.

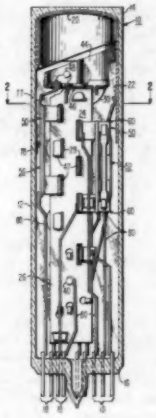
---

**4,370,585**

## EVAPORATOR SUPPORT ASSEMBLY FOR A PHOTOMULTIPLIER TUBE

**Gilbert N. Butterwick, Leola, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Aug. 29, 1980, Ser. No. 182,768**
**Int. Cl.³ H01J 40/06**
**U.S. Cl. 313—102** **10 Claims**



1. An electron discharge device comprising an evacuated envelope having an interior surface, a photoemissive cathode within said envelope, an electrode assembly having at least one electrode spaced from said cathode, an alkali metal source within said envelope for vapor depositing at least one alkali metal to form said cathode, and evaporator support means including at least one insulator support member attached to said electrode assembly for aligning said electrode assembly with respect to said interior envelope surface, said evaporator support means including at least a pair of electrical terminals attached to said insulator member and to said alkali metal source to provide support thereto and means for evaporating alkali metal therefrom.

---

**4,370,586**

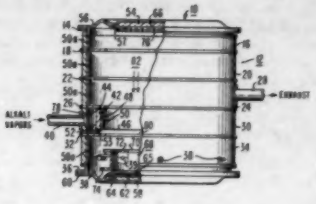
## IMAGE INTENSIFIER TUBE HAVING AN INTERNAL ALKALI BAFFLE

**Robert W. Fitts, Lititz, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Mar. 27, 1981, Ser. No. 248,062**
**Int. Cl.³ H01J 31/50, 40/06**
**U.S. Cl. 313—102** **12 Claims**

1. In an image intensifier tube including a substantially cylindrical envelope having a photoemissive cathode at one end and a phosphor screen at the other end, said envelope also including a tubulation extending therethrough for introducing a constituent of said cathode, the improvement comprising

a baffle ring of an electrically insulative material located inside said tube adjacent said tubulation, said baffle ring forming an interior annular chamber with said cylindrical envelope, the chamber having an annular exit passage




between said baffle ring and an inwardly-extending portion of said envelope.

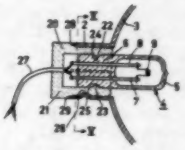
---

**4,370,587**

## LAMP/REFLECTOR UNIT

**Victor R. Notelteirs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 21, 1980, Ser. No. 208,969**
**Claims priority, application Netherlands, Dec. 21, 1979, 7909231**
**Int. Cl.³ H01J 5/16, 61/40**
**U.S. Cl. 313—113** **7 Claims**



1. A lamp/reflector unit comprising a metal reflector body having a necked portion near the apex of a concave reflecting portion and also comprising an electric lamp having a glass lamp envelope with a pinch seal in which current supply conductors are embedded which extend from outside the lamp envelope to an electric element accommodated inside the lamp envelope, which pinch seal is fixed in the necked portion of the reflector body, characterized in that the pinch seal of the lamp envelope is enclosed laterally between at least two moulded members, the surface of the pinch seal is provided with a profiled portion which is in engagement with counter-profiled portion on at least one of the moulded members and keeps the lamp locked against axial movement, and that the necked portion of the reflector body keeps the lamp with the moulded members fixed in the reflector body.

---

**4,370,588**

## CATHODE ASSEMBLY

**Kenji Takahashi, Hyogo, and Yukio Takanashi, Hiratsuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 20, 1980, Ser. No. 161,569**
**Claims priority, application Japan, Jun. 21, 1979, 54-77522**
**Int. Cl.³ H01J 1/94, 19/48**
**U.S. Cl. 313—270** **5 Claims**

1. A cathode assembly for cathode-ray tube comprising:

a cathode sleeve having a blackened surface;

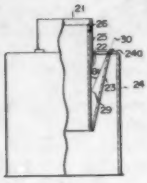
a first cylindrical reflective member having an unblackened surface fixedly positioned about a top end portion of said cathode sleeve with a fixing point therebetween and hav-

ing one end portion thereof closed by a metal member; and

a second cylindrical reflective member positioned about said cathode sleeve on the same axis therewith and having a diameter greater than that of said cathode sleeve,

support member means for fixing the position of said second cylindrical reflective member with respect to said cathode sleeve,

both said first and second cylindrical reflective members providing means for reflecting radiant heat from said cathode sleeve,




said second cylindrical reflective member having an upper portion that is apart from and overlapping in vertical position a lower portion of said first cylindrical reflective member, and

the length of said first cylindrical reflective member being selected such that an angle formed between the longitudinal direction of said cathode sleeve and a straight line connecting a heat radiation peak point on the outer surface of said cathode sleeve and an inner edge of a top opening portion of said second cylindrical reflective member, on a plane passing through said same axis, is 30° or less.

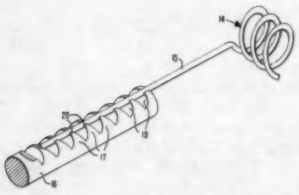
---

**4,370,589**

## FILAMENT CONNECTOR MEANS FOR ELECTRIC INCANDESCENT LAMP

**Aristide R. DeCaro, Edison, and Henry M. Nixon, Westfield, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 2, 1980, Ser. No. 182,923**
**Int. Cl.³ H01K** *1/42, 9/08*
**U.S. Cl. 313—315** **7 Claims**




1. In an electric incandescent lamp having a sealed light-transmitting envelope, the combination of;

a filament of refractory metal wire having a coiled body portion and uncoiled leg portions that extend laterally from and terminate said coiled body portion,

a pair of substantially rigid lead-in wires extending into said envelope and having inner end segments that are disposed in aligned overlapped relationship with the respective uncoiled leg portions of the filament, and

means electrically connecting the uncoiled leg portions of the filament to the associated overlapped end segments of said lead-in wires comprising a plurality of spaced serrations on each of the end segments of the lead-in wires that are welded to said leg portions,

said serrations extending transversely across the respective lead-in wire segments and being so spaced and dimensioned that the filament leg portions are in bridging relationship with a plurality of the serrations on the associated lead-in wire segments and are also fused to only the crowns of the bridged serrations so that the filament is thereby securely fastened to each of the lead-in wires at a series of spaced locations along the respective lead-in wires.

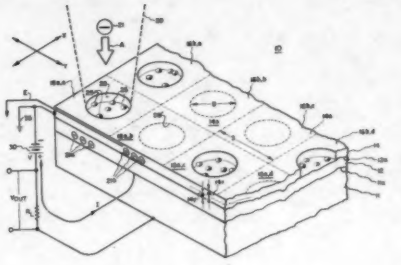
---

**4,370,590**

## METHOD FOR WRITING ON ARCHIVAL TARGET AND TARGET PRODUCED THEREBY

**Harold F. Webster, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 68,680, Aug. 22, 1979, Pat. No. 4,287,572.**
**This application Sep. 25, 1980, Ser. No. 190,941**
**Int. Cl.³ H01J** *31/08, 31/58*
**U.S. Cl. 313—391** **12 Claims**



1. An archival memory target for use in an electron-beam-addressed memory, comprising:

a substrate of a semiconductor material, said substrate having a surface;

a single continuous layer of insulative material fabricated upon said semiconductor substrate surface; and

a layer of a conductive masking material fabricated directly upon a surface of the single insulative layer furthest from the substrate; said masking material being material which, when molten, does not wet the surface of the single insulative layer an aperture being melted through only the masking material layer at each data storage site at which a first binary value of data is to be stored in a two-dimensional array of potential data storage sites assigned upon the surface of the masking layer farthest from said insulative layer, the material of said masking layer remaining unmelted at others of the potential data storage sites of said array at which the remaining value of binary data is to be stored.

---

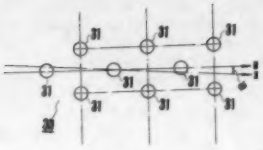
**4,370,591**

## COLOR PICTURE TUBE SHADOW MASK

**Yoshio Satoh, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 18, 1980, Ser. No. 179,475**
**Claims priority, application Japan, Sep. 14, 1979, 54-117251; Nov. 14, 1979, 54-146559**
**Int. Cl.³ H01J** *29/07, 29/80*
**U.S. Cl. 313—402** **4 Claims**

1. In a color picture tube comprising a fluorescent screen formed on the inner surface of the panel and consisting of a majority of trios of phosphor dots, a dot type shadow mask having apertures which are arrayed horizontally and vertically and spaced from the fluorescent screen by a predetermined distance, and an in-line type three-electron-gun structure for emitting beams of electrons which pass through said apertures of the shadow mask and impinge upon the fluorescent screen to establish trios of electron beams, the improvement wherein the horizontal arrangement of said apertures is defined by,



$$x = \frac{n}{2} P_H$$

$$y = \frac{mP_V}{2} \epsilon \frac{1}{2} A\left(\frac{nP_H}{2}\right)^2$$

where x and y represent coordinates of the apertures of the shadow mask in Cartesian coordinates whose origin coincides with the center of the fluorescent screen, Pv the vertical pitch between apertures of the shadow mask at coordinates (0, 0), $P_H$ the horizontal pitch between apertures at coordinates (0, 0), m and n an integer, (m+n) being an even number, and A a constant, such that the interdistance between adjacent electron beams on the fluorescent screen based on beams of electrons passing through said apertures at the corners of the shadow mask is made substantially equal.

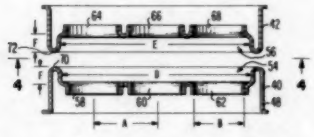
---

**4,370,592**

## COLOR PICTURE TUBE HAVING AN IMPROVED INLINE ELECTRON GUN WITH AN EXPANDED FOCUS LENS

**Richard H. Hughes, and Bruce G. Marks, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Oct. 29, 1980, Ser. No. 201,692**
**Int. Cl.³ H01J** *29/50, 29/56*
**U.S. Cl. 313—414** **11 Claims**



1. In a color picture tube havinng an inline electron gun for generating and directing a plurality of electron beams along coplanar paths toward a screen of said tube, said gun including a main focus lens for focusing said electron beams, the improvement comprising

the main focus lens being formed by two spaced electrodes, each electrode including a portion having a plurality of apertures therein equal to the number of electron beams, each electrode also including a peripheral rim, the peripheral rims of the two electrodes facing each other, the apertured portion of each electrode being within a recess set back from the rim, said recess having substantially straight wall sections parallel to the coplanar paths of the electron beams.

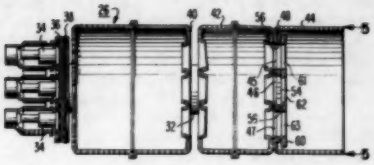


**4,370,593**

## IN-LINE ELECTRON GUN AND METHOD FOR MODIFYING THE SAME

**Raymond H. Sweigart, Lancaster, and Mary E. Doersom, Ephrata, both of Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Dec. 30, 1980, Ser. No. 221,434**
**Int. Cl.³ H01J** *29/50*
**U.S. Cl. 313—414** **6 Claims**



1. An in-line electron gun comprising:

first electrode means for producing and directing a plurality of electron beams along spaced co-planar paths having a common general direction,

second electrode means disposed along said beam paths and spaced from said first electrode means for focusing said beams,

a shield cup disposed adjacent to said second electrode means, said shield cup having a back surface with a plurality of co-planar apertures therethrough, and

a first pair of magnetically permeable members attached to said back surface of said shield cup, said first pair of magnetic members being disposed adjacent to one of said shield cup aperture, the combination with said shield cup of;

a nonmagnetic plate having a plurality of co-planar plate apertures therethrough, and

a second pair of magnetically permeable members attached to one surface of said plate, said plate being attached to said back surface of said shield cup so that said second pair of members are disposed between said shield cup and said plate and whereby said plate apertures are substantially aligned with said shield cup apertures.

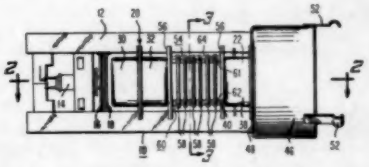
---

**4,370,594**

## RESISTIVE LENS STRUCTURE FOR ELECTRON GUN

**Philip Kuzenetzoff, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 29, 1978, Ser. No. 964,539**
**Int. Cl.³ H01J** *29/56, 29/48, 29/82*
**U.S. Cl. 313—458** **8 Claims**



1. An electron gun comprising:

(a) first and second accelerating and focusing electrodes fixedly mounted on a plurality of elongated insulator support rods disposed alongside said electrodes, and

(b) a resistive lens structure disposed between and electrically connected to said accelerating and focusing electrodes, said lens structure comprising:

(1) a plurality of apertured electrode plates which are mutually spaced with their apertures sufficiently aligned to permit passage of an electron beam along a

path therethrough, and, which when impressed with mutually different voltages, established an extended electron beam focusing lens between said first and second accelerating and focusing electrodes, and

(2) a plurality of resistive spacer blocks alternately stacked with said electrode plates, there being at least one of said resistive blocks disposed between and in contact with each pair of adjacent electrode plates, whereby a high resistance continuity is provided from electrode plate to electrode plate along the stack of electrode plates and resistive blocks from one end of said stack to the other, and

(c) wherein said first and second accelerating and focusing electrodes comprise means for applying different electrical voltages to the ends of said stack whereby current flows through said stack thereby creating said mutually different voltages on each of said electrode plates, thereby establishing said extended electron beam focusing lens.

---

**4,370,595**

## LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

**Petrus J. M. Willemsen; Willem L. Konijnendijk, and Robert C. Peters, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 2, 1980, Ser. No. 165,326**

**Claims priority, application Netherlands, Jul. 3, 1979, 7905162**

**Int. Cl.³ H01J *61/30, 61/44***

**U.S. Cl. 313—486** **4 Claims**

1. A low-pressure mercury vapor discharge lamp for radiation purposes having a discharge tube made of glass having an absorption edge between 280 and 305 nm, the tube being coated on the inside with a luminescent layer comprising a luminescent material which has the characteristic line emmission of gadolinium at 312 nm, the luminescent layer comprises a borate activated by Gd and Bi, this borate having a composition defined by the formula $LA_{1-x-y}GdxBi_yO_6$, wherein 0.15 is less than or equal to x, 0.001 is less than or equal to y which is less than or equal to 0.05 and (x+y) is less than or equal to 1, the luminescent layer containing a ternary aluminate activated by Gd and Pb and having the hexagonal magneto-plumbite structure, the aluminate having the composition ABC, wherein A represents from 25–99 mole % ½ $Gd_2O_3$, 1–35 mole % PbO and, up to ½ $La_2O_3$, wherein B represents $Al_2O_3$, not more than 20 mole % of the $Al_2O_3$ being replaceable by $Sc_2O_3$ and wherein C represents a material selected from the group consisting of MgO and ZnO, up to 10 mole % of the $Al_2O_3$ possibly being replaceable by an equivalent quantity of $SiO_2$ together with at least a compound selected from the group consisting of MgO and ZnO, up to 70 mole % of A being replaceable by a compound selected from the group consisting of SrO and CaO, simultaneously, an amount of C equivalent to the amount of B replaced, being replaceable by ½ $Al_2O_3$, A, B and C satisfying the conditions [A] is greater than or equal to 0.02, 0.55 is less than or equal to [B] which is less than or equal to 0.95 and [C] is greater than or equal to ½ A.

**4,370,596**

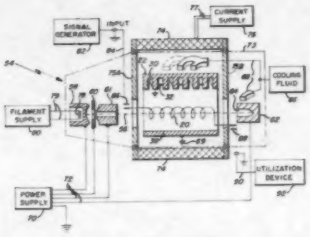
## SLOW-WAVE FILTER FOR ELECTRON DISCHARGE DEVICE

**Donald L. Winsor, Wakefield, Mass., assignor to Raytheon Company, Lexington, Mass.**

**Filed May 1, 1970, Ser. No. 33,759**

**Int. Cl.³ H01J *25/34***

**U.S. Cl. 315—3.6** **6 Claims**




1. A traveling wave electron interaction device comprising:

a helical periodic electromagnetic energy slow-wave propagating structure comprising a plurality of spaced elements;

a plurality of dielectric members contacting each of said slow-wave structure elements and defining therebetween a plurality of spaced apertures; and

a filter assembly comprising a plurality of waveguides periodically successively contacting the dielectric members on at least one side of said slow-wave structure;

said waveguides defining therebetween a parallel plate transmission line having a predetermined cutoff frequency characteristic to substantially inhibit propagation of energy in the backward wave mode without substantially perturbing amplification of forward wave modes of said energy propagating along said structure.

---

**4,370,597**

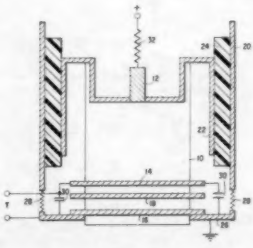
## THYRATRON SWITCH FOR NARROW PULSES

**Maurice Weiner, Ocean City, and William Beattie, Rumson, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 12, 1981, Ser. No. 224,603**

**Int. Cl.³ H03K *3/55***

**U.S. Cl. 315—58** **7 Claims**



1. Apparatus for supplying narrow width high voltage modulation pulses to a load, comprising a switch which is a thyratron having anode, grid and cathode electrodes; resistance means connected between the anode electrode and the positive side of a high voltage direct-current source; a connection from the cathode electrode to the negative side of said source; an outer cylindrical shield surrounding said thyratron; said load being coupled between said outer shield and the cathode electrode; an inner cylindrical shield located between said outer

shield and the thyratron, with means connecting the anode electrode to the inner shield, to thereby provide capacitive energy storage means between the anode electrode and the outer shield; operative in response to a trigger pulse between the grid and cathode electrodes which causes the thyratron to conduct and thereby produces said narrow width high voltage output pulse at said load.

---

**4,370,598**

**BIFILAR HELICAL ELECTRODE ARRANGEMENT FOR TRANSVERSELY EXCITING GASEOUS LASER MEDIA**

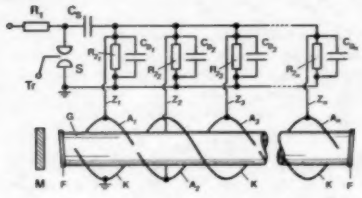
**Karl-Heinz Krahn, Hustadtring 147, 4630 Bochum-Querenburg, Fed. Rep. of Germany**

**Filed Sep. 24, 1980, Ser. No. 190,367**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939121**

**Int. Cl.³ H01J *7/44***

**U.S. Cl. 315—59** **7 Claims**



**1.** A bifilar helical electrode arrangement for the transverse excitation of a gaseous laser medium disposed within a laser envelope, comprising a helical anode and a helical cathode extending along said laser envelope, a plurality of capacitors closely adjacent to and spaced along the lengths of said anode and said cathode, low resistance and low inductance leads connecting one terminal of each capacitor to said anode, low resistance and low inductance leads connecting the other terminal of each capacitor to said cathode, and a pulse generator connected between said anode and cathode for delivering high-voltage pulses to said capacitors in parallel.

---

**4,370,599**

**SELF SHIFT TYPE GAS DISCHARGE PANEL**

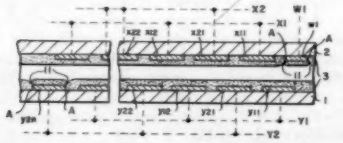
**Tsutae Shinoda, Akashi; Kazuo Yoshikawa, Kobe, and Yoshinori Miyashita, Himeji, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 5, 1980, Ser. No. 213,464**

**Claims priority, application Japan, Dec. 17, 1979, 54-164319**

**Int. Cl.³ H05B *37/02***

**U.S. Cl. 315—217** **19 Claims**



**1.** A self shift type gas discharge panel comprising

a regularly arranged plurality of discharge cells defining an array of shift channels wherein electrodes defining the discharge cells are sequentially and regularly connected to a plurality of buses, covered with a dielectric layer and placed face to face in a gas discharge space,

a write discharge cell with a write electrode at one end of each said shift channel, and

path means provided in said dielectric layer for leaking wall charges accumulated on said dielectric layer to at least one outermost electrode along each said shift channel.

---

**4,370,600**

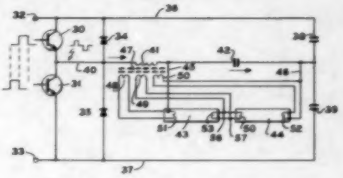
**TWO-WIRE ELECTRONIC DIMMING BALLAST FOR FLUORESCENT LAMPS**

**Zoltan Zansky, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 26, 1980, Ser. No. 210,651**

**Int. Cl.³ H05B *41/29, 41/392***

**U.S. Cl. 315—244** **23 Claims**



**1.** A two-wire electronic ballast arrangement for fluorescent lamp dimming comprising:

a source of direct current;

a source of variable square wave voltage; inverter means adapted to be fed by said source of direct current and modulated by said variable square wave voltage, said inverter means including resonant inductor-capacitor circuit means having inductive coil means and first capacitor means connected in series adapted to resonate at their natural frequency and to provide sinusoidal voltage across said capacitor means as the output of said inverter means to the fluorescent lamps;

auxiliary winding means associated with said inductive coil means, said auxiliary winding means being adapted to be connected to the filaments of one or more fluorescent lamps for heating, such that the voltage supplied to heat the filaments of said one or more lamps remains substantially constant during dimming of said one or more fluorescent lamps, said fluorescent lamps further being adapted to be connected across said first capacitor means.

---

**4,370,601**

**HIGH PRESSURE DISCHARGE LAMP APPARATUS**

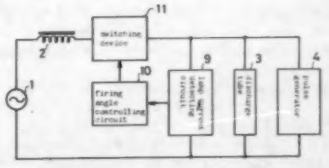
**Shigeru Horii, Suita; Nobuhisa Yoshikawa, Sakai, and Kazutaka Koyama, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Apr. 20, 1981, Ser. No. 255,635**

**Claims priority, application Japan, Apr. 21, 1980, 55-53063**

**Int. Cl.³ G05F *1/00***

**U.S. Cl. 315—307** **5 Claims**



**1.** A high pressure discharge lamp apparatus comprising:

a discharge tube,

a current limiting device and an over-current protecting device which are connected in series with said discharge tube across a power source,

a pulse generator connected in parallel to said discharge tube to supply pulses to said discharge tube, and

a lamp current detecting circuit to detect a lamp current and give control signal to said over-current protecting device.

---

**4,370,602**

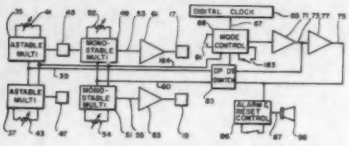
**WATERBED VIBRATOR**

**Johnny O. Jones, Jr., #1 Cross Creek, Irvine, Calif. 92714, and Charles C. White, Jr., 1300 Adams, Apt. 5P, Costa Mesa, Calif. 92626**

**Division of Ser. No. 800,588, May 25, 1977, abandoned. This application Mar. 31, 1980, Ser. No. 135,297**

**Int. Cl.³ H02K** *33/00*

**U.S. Cl. 318—114** **16 Claims**




1. A vibrator system for inducing vibration in furniture, comprising:

a pair of electrical-mechanical transducers mounted at spaced locations on said furniture, each of said transducers producing output mechanical vibration, the amplitude and frequency of which is independently controlled by the respective amplitude and frequency of a pair of independent electrical driving signals;

means producing said independent pair of electrical driving signals, said means supplying independent cyclicly varying signals to each of said pair of transducers, said means independently controlling the frequency and amplitude of each of said pair of signals, said means comprising:

a pair of astable multivibrators;

a pair of monostable multivibrators, each of said monostable multivibrators responsive to one of said astable multivibrators and connected to drive one of said transducers;

a pair of switching transistors, each of said transistors responsive to one of said monostable multivibrators for controlling the current to one of said transducers; and

each of said pair of astable multivibrators and each of said pair of monostable multivibrators including an independent control element permitting control of the frequency and amplitude of vibration of said transducers; and

means producing an output ramp signal for controlling said independent control elements of each of said two astable multivibrators and each of said two monostable multivibrators.

---

**4,370,603**

**SHUNT FIELD CONTROL APPARATUS AND METHOD**

**James H. Franz, Jr., Murrysville, and Stanley W. Jones, McMurray, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Oct. 23, 1980, Ser. No. 199,798**

**Int. Cl.³ H02P** *5/06*

**U.S. Cl. 318—523** **12 Claims**

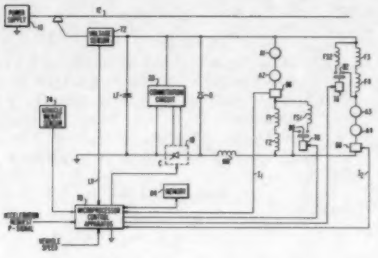
9. In the method of controlling field operation of a motor coupled with a chopper operative with a supply line voltage, said motor having a full field mode and a shunt field mode and being operative with a chopper having a current limit, the steps of

determining the actual full field mode current of the motor,

determining the actual chopper current limit in relation to the supply line voltage,

determining a predicted shunt field mode current in relation to the actual full field mode current when the motor is in the full field mode,

comparing a predicted shunt field mode current with the actual chopper current limit to establish when a predetermined relationship has occurred, and



providing the shunt field mode of the motor when that relationship has occurred after a predetermined full field mode of that motor.

---

**4,370,604**

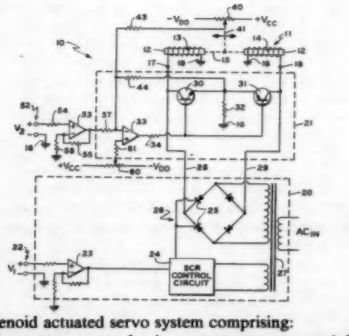
**SOLENOID ACTUATED SERVO SYSTEM**

**Patrick J. Griffin, Annapolis, Md., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jun. 25, 1981, Ser. No. 277,561**

**Int. Cl.³ G05B** *11/00*

**U.S. Cl. 318—687** **10 Claims**




1. A solenoid actuated servo system comprising:

solenoid actuator means having armature means and first and second coils, energization of which respectively tends to move the armature means in opposite directions;

position control means having an input terminal for receiving a position control voltage and first and second output terminals for supplying electric currents suitable for energizing the coils of said solenoid actuator means, the currents varying differentially in response to variations in the position control voltage;

means connecting the first and second output terminals of said position control means to the first and second coils respectively of said solenoid actuator means;

feedback means for generating a feedback voltage indicative of the position of the armature means of said solenoid actuator means;

position command input means for receiving a position command signal and supplying a corresponding position command voltage; and

combining means connected to receive and combine the feedback voltage and the position command voltage to

produce the position control voltage, and to supply the position control voltage to said position control means.

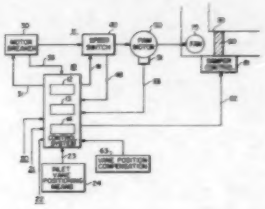
---

**4,370,605**

## TWO-SPEED MOTOR CONTROL

**Stephen J. Breznican, New Kensington, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 2, 1980, Ser. No. 182,922**
**Int. Cl.³ H02P** *5/40*
**U.S. Cl. 318—773** **13 Claims**



1. A control system for controlling the speed of a motor system having a pole-amplitude-modulated (PAM) motor which includes a set of windings which can be connected in different configurations to produce respectively different motor operating speeds; said control system comprising:

switching means for connecting the motor windings in a low speed configuration in one switch state and for connecting the motor windings in a high speed configuration in a second switch position;

breaker means for coupling the motor windings to a power source;

sequencer means for changing the motor speed on demand when predetermined permissive conditions exist, said sequencer means in sequence opening said breaker means if it is closed and operating said switching means to configure the motor winding for the demanded speed and closing said breaker means to enable the motor to be moved to the demand speed; and

means for generating confirmation signals for the state of at least said switch means and said breaker means to advance the operation of said sequencer means during a motor speed change.

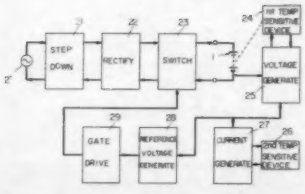
---

**4,370,606**

## CHARGING APPARATUS

**Hiromi Kakumoto, and Kaoru Furukawa, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Oct. 10, 1980, Ser. No. 196,014**
**Claims priority, application Japan, Oct. 13, 1979, 54-132266**
**Int. Cl.³ H02J** *7/10*
**U.S. Cl. 320—35** **29 Claims**




1. A charging apparatus for a rechargeable battery, comprising:

charging current providing means for providing a charging current to said rechargeable battery,

first temperature detecting function means responsive to the temperature of said rechargeable battery,

second temperature detecting function means responsive to the ambient temperature,

current generating means responsive to one of said first and second temperature detecting function means for generating a current which is changeable following the change of the temperature as detected,

voltage generating means connected to receive said current generated from said current generating means and responsive to the other of said first and second temperature detecting function means for generating a voltage which is changeable following the change of the temperature detected, and

charge control means responsive to the output voltage of said voltage generating means for controlling said charging current provided from said charging current providing means to said rechargeable battery.

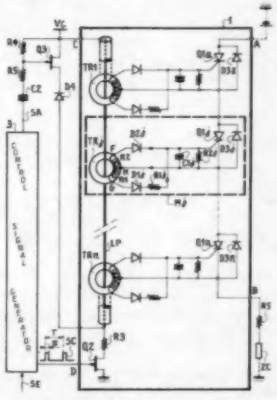
---

**4,370,607**

## STATIC HIGH VOLTAGE SWITCH USABLE IN A SWITCHABLE HIGH VOLTAGE D.C. GENERATOR

**Jacques Dassonville, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Apr. 24, 1981, Ser. No. 257,131**
**Claims priority, application France, Apr. 29, 1980, 80 09619**
**Int. Cl.³ H03K** *17/74*
**U.S. Cl. 323—271** **7 Claims**



1. A static high voltage switch for controllably coupling and decoupling a high voltage D.C. source to and from a load, comprising:

a bridge of n series-connected, electrically controllable switch circuits, each switch circuit including at least one semiconductor switching element and having a current input, a current output and a control port including a control input and a contol return, the current output of a switch circuit being connected to the current input of the adjacent switch circuit of the bridge to form the series connection of switch circuits, the current input of the first switch circuit of the bridge and the current output of the last switch circuit of the bridge comprising terminal ends of the bridge for connection to the high voltage D.C. source and load, respectively;

a plurality of n-toroidal cores, one core being associated with each of the switch circuits, each core being wound with a secondary winding including first and second ends and an intermediate tap;

a plurality n of circuit means, one circuit means being associated with each toroidal core and its corresponding switch

circuit for coupling the secondary winding of its associated toroidal core to the control port of its associated switch element, each circuit means including a first diode and series resistor coupling the first end of its associated secondary winding to the control input of its associated switch circuit, a second diode coupling the second end of the associated secondary winding to the control input, means for coupling the control return to the intermediate tap of the secondary, and a capacitor coupling the control input to the control return; and

a primary winding formed by an insulated wire element passing through each of the n-toroidal cores for coupling to an external control signal source for controlling the static high voltage switch.

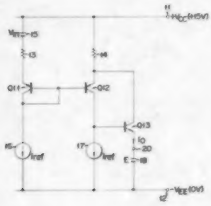
---

**4,370,608**

## INTEGRABLE CONVERSION CIRCUIT FOR CONVERTING INPUT VOLTAGE TO OUTPUT CURRENT OR VOLTAGE

**Katsumi Nagano, Hiratsuka, and Daijiro Kubo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Apr. 8, 1981, Ser. No. 252,197**
**Claims priority, application Japan, Apr. 14, 1980, 55-49022**
**Int. Cl.³ G05F *3/16***
**U.S. Cl. 323—316** **7 Claims**



1. A conversion circuit comprising:

a. first and second power supply terminals adapted for connection respectively to high and low potentials of a DC power source;

b. first and second transistors each having a base, emitter, and collector, the bases of said first and second transistors being commonly connected to each other;

c. first resistance means having first and second ends with the first end thereof connected to the emitter of said first transistor;

d. second resistance means connected between the emitter of said second transistor and said first power supply terminal and having a resistance value substantially equal to that of said first resistance means;

e. input voltage supply means connected to said second end of said first resistance means and said first power supply terminal for supplying an input voltage;

f. first and second current supply means respectively connected between the collector of said first transistor and said second power supply terminal and between the collector of said second transistor and said second power supply terminal for supplying said first and second transistors with currents; and

g. output control means having the main current path thereof connected between the emitter of said second transistor and an output terminal and being controlled by the signal from the connecting point between said second transistor and said second current supply means.

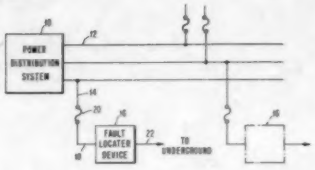
---

**4,370,609**

## FAULT ISOLATOR FOR ELECTRIC UTILITY DISTRIBUTION SYSTEMS

**Delano D. Wilson, Scotia, and Dale E. Hedman, Schenectady, both of N.Y., assignors to Power Technologies, Inc., Schenectady, N.Y.**

**Filed Jun. 8, 1981, Ser. No. 271,222**
**Int. Cl.³ G01R *31/02***
**U.S. Cl. 324—51** **15 Claims**



1. Apparatus for detecting faults on a power line in an electrical power system; comprising:

a variable impedance means which provides a first low impedance and a second high impedance;

power line switching means for connecting said variable impedance means in series with said power line to provide a sufficient voltage on said power line to cause an initial current $I_1$ to flow to test for a fault; and

said variable impedance means including reactance means responsive to said initial current $I_1$ of predetermined value to cause said variable impedance means to exhibit said first low impedance while said initial current $I_1$ flows for a predetermined period of time to enable detection of a fault condition, and reactance switching means responsive to said initial current $I_1$ to cause said variable impedance means to exhibit said second high impedance thereby limiting the flow of current to a low level $I_2$;

whereby said apparatus limits both the magnitude and time duration of the current so as not to adversely effect system components.

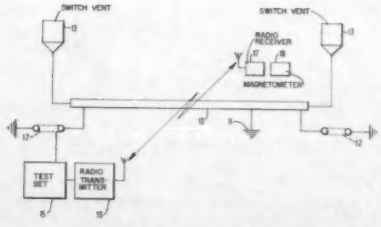
---

**4,370,610**

## LOCATING SHEATH FAULTS IN UNDERGROUND POWER SUPPLY CABLES

**Kenneth R. Allen, Longwood; John K. Allen, Huddersfield, and Gordon G. McNally, Fenay Bridge, all of England, assignors to Bicc Public Limited Company, London, England**

**Filed Aug. 27, 1979, Ser. No. 69,855**
**Claims priority, application United Kingdom, Aug. 30, 1978, 34935/78**
**Int. Cl.³ G01R *31/08***
**U.S. Cl. 324—52** **10 Claims**



8. Apparatus for locating an earth fault on a sheath of an underground cable comprising means for applying pulses of direct current to a sheath, means for producing synchronizing signals coincident with the d.c. pulses, a portable magnetome-

ter, with a visual indicator, for searching for the magnetic field due to a fault current to earth flowing in the sheath and, associated with the magnetometer, a portable receiver for receiving the synchronized signals, the arrangement being such that visual indications on the magnetometer and said synchronized signals can be compared to identify the approximate position of the earth fault along the cable.

---

**4,370,611**

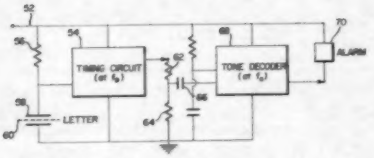
## IDENTIFICATION OF MATERIALS USING THEIR COMPLEX DIELECTRIC RESPONSE

**William D. Gregory, Vienna, and Luigi Moreili, Sterling, both of Va., assignors to Georgetown University, Washington, D.C.**

**Continuation of Ser. No. 847,425, Nov. 1, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,452**

**Int. Cl.³ G01R** *27/26*

**U.S. Cl. 324—61 R** **12 Claims**




1. Method for identifying material having frequency responsive dielectric and conductive properties, said method comprising:

(a) providing a capacitive system for producing an output signal and for producing a change in output signal when a material to be identified is brought within the influence of said capacitive system, said output signal having a value reflective of the dielectric and conductive properties of said material, said capacitive system including at least one capacitive element;

(b) establishing a reference value of an output signal of said capacitive system in the absence of any material to be identified in said system, said output signal being with reference to a plurality of frequencies applied to said system, each of said plural frequencies being pre-selected so that output signal has a value reflective of said dielectric and conductive properties when said material is brought within the influence of said system;

(c) introducing the material to be identified into the influence of said capacitive system and subjecting said material to said plurality of frequencies to produce an output signal having a value reflective of the dielectric and conductive properties of said material;

(d) resolving said output signal into separate resolved components including a resolved capacitive component and a resolved conductive component, for each of said plural pre-selected frequencies, each of said resolved capacitive and conductive components having a value reflective of said dielectric and conductive properties of said material;

(e) identifying said material by determining the change in value of at least one of said resolved capacitive and conductive components for each of said plural pre-selected frequencies from the reference value of said output signal to the value obtained when said material is brought within the influence of said capacitive system, to give at least one set of material identification data corresponding to at least one of said resolved capacitive and conductive components at each of said plural pre-selected frequencies, said at least one set of material identification data corresponding to said dielectric and conductive properties of said material, and using at least one of said sets to identify said material.

**4,370,612**

## INTERFEROMETRIC OPTICAL FIBER ELECTRIC CURRENT MEASURING DEVICE

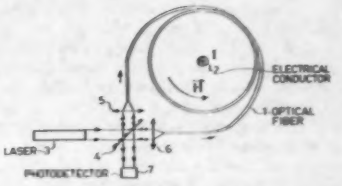
**Claude Puech; Herve Arditty, and Michel Papuchon, all of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Jul. 23, 1980, Ser. No. 171,285**

**Claims priority, application France, Jul. 24, 1979, 79 19078**

**Int. Cl.³ G01R** *19/00*

**U.S. Cl. 324—117 R** **10 Claims**




1. An interferometric optical-fiber device for measuring electrical currents comprising a wound optical fiber forming at least one turn about the conductor in which flows the current I to be measured, the two ends of said optical fiber being coupled to a light source by means of an optical device comprising means for separating the beam from the source into two waves intended to flow in the fiber in opposite directions, said optical device comprising also means for recombining the waves emerging from the fiber and a device for detecting the radiation resulting from the recombination, the signal from said detection device being related to the phase shift $\Delta\phi_1$ between the two waves flowing in opposite directions, this phase shift being induced by the current I by Faraday effect in the fiber, said measuring device comprising furthermore a signal-processing device coupled to the detector supplying a current measurement.

---

**4,370,613**

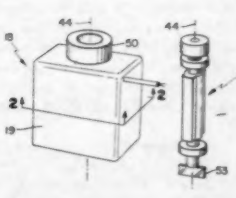
## GALVANOMETER WITH MOLDED OUTER LAYER UNDER HOOP STRESS

**Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.**

**Continuation-in-part of Ser. No. 96,612, Nov. 23, 1979, abandoned, and Ser. No. 81,171, Oct. 2, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,597**

**Int. Cl.³ G01R** *1/04, 5/14;* **H02K** *15/14;* **H05K** *5/00*

**U.S. Cl. 324—154 R** **20 Claims**




1. A limited rotation galvanometer having a shaft adapted to be deflected in accordance with an electrical drive signal applied to said galvanometer,

said galvanometer comprising a stator assembly formed of at least one stationary permanent magnet and at least one pole piece cooperatively arranged about a hollow bore,

a rotor associated with said shaft and mounted to turn in said hollow bore,

and an electrical winding wound about said pole piece and adapted to receive said drive signal,

said stator assembly and rotor defining magnetic circuitry for operation of said galvanometer,

the deflection of said rotor being dependent upon the rigidity of said stator assembly and the value of the torque applied between said stator assembly and said rotor by the application of said drive signal to said winding,

said galvanometer including a molded, hoop-like outermost layer of rigid, reinforced stress-resistant synthetic resin material extending continuously around the exterior of said galvanometer,

said synthetic resin having the property of shrinking at least 1% during solidification,

said layer engaging the outer surfaces of said winding, said magnet, and said pole piece,

said molded hoop-like layer residing under substantial prestress hoop tension as the result of shrinkage during solidification of said synthetic resin during molding,

said molded hoop-like external layer applying stress to said stator assembly, thereby to force said magnet and said pole piece against one another, thereby imparting rigidity to said stator assembly and contributing to the accuracy of the deflection of said galvanometer.

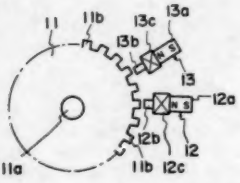
---

**4,370,614**

## SPEED AND DIRECTION DETECTOR

**Shigeki Kawada, Hino, and Hiroshi Ishida, Hamuramachi, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Jul. 28, 1980, Ser. No. 172,651**
**Claims priority, application Japan, Jul. 25, 1979, 54/102600**
**Int. Cl.³ G01P *3/48, 3/54***
**U.S. Cl. 324—173** **4 Claims**




1. A speed anad direction detector for detecting the rotational speed and the rotational direction of a rotary machine, comprising:

a circular rotational member having a plurality of equally speced-apart teeth on the outer circumference thereof;

first and second magnetic sensors positioned in such a manner that said first magnetic sensor is located at a position displaced circumferentially from one of said equally spaced-apart teeth of said circular rotational member by an angular distance equivalent to $\frac{1}{4}$ of the pitch of said equally spaced-apart teeth when said second magnetic sensor is directly opposite one of said equally spaced-apart teeth;

a rotational direction discriminating circuit operatively connected to said first and second magnetic sensors; and

a housing including a yoke member to which said first and second magnetic sensors are fixedly secured;

said first and second magnetic sensors each comprising:

a permanent magnet secured fixedly to the yoke member of the housing;

a magnetic pole extending from said permanent magnet and positioned so as to face the equally spaced-apart teeth on said circular rotational member; and

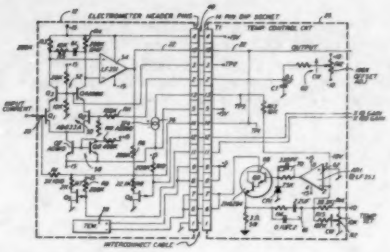
a detection coil wound upon said magnetic pole, said permanent magnet, said magnetic pole, said equally spaced-apart teeth on said circular rotational member, the body of said rotational member and said housing forming a magnetic path.

**4,370,615**

## HIGH SPEED TEMPERATURE CONTROLLED ELECTROMETER

**Wayne J. Whistler, Glendora, and Robert S. Loveland, West Covina, both of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed Oct. 14, 1980, Ser. No. 196,997**
**Int. Cl.³ G01N *27/00***
**U.S. Cl. 324—457** **19 Claims**



1. An electrometer for measuring extremely low currents, in the order of ion current levels, comprising:

an input and an output,

preamplifier means connected to said input and adapted to convert the current applied to said input to a voltage corresponding in value to the value of said input current,

sensor means connected to said preamplifier means for sensing the temperature of said preamplifier during its operation, and

means connected to said sensor means for controlling the temperature of said preamplifier and sensor means during operation so as to maintain said preamplifier and sensor within a predetermined range of temperature.

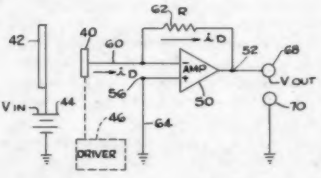
---

**4,370,616**

## LOW IMPEDANCE ELECTROSTATIC DETECTOR

**Bruce T. Williams, 86 Park Lane Cir., Lockport, N.Y. 14094**

**Filed Aug. 15, 1980, Ser. No. 178,387**
**Int. Cl.³ G01R *5/28***
**U.S. Cl. 324—458** **12 Claims**




1. A non-contacting electrostatic detector comprising:

(a) a detector electrode sensitive to electrostatic quantities such as electrostatic fields, voltages, charges and the like;

(b) means operatively associated with said electrode for varying the capacitive coupling between said electrode and an electrostatic quantity to which said electrode is exposed;

(c) an operational amplifier having an output and a pair of inputs, one of which is operatively associated with the summing node of the amplifier;

(d) means for defining a feedback path between said amplifier output and said amplifier summing node, said feedback path having an impedance;

(e) means for connecting said detector electrode to said one

amplifier input so that said detector is operated directly into said amplifier summing node; and

(f) means for connecting the other of said amplifier inputs to an electrical reference;

(g) whereby said detector is held at virtual ground and said amplifier is operated as a current to voltage converter to provide an output voltage equal to the product of the amplifier input current and the impedance of said feedback path.

---

**4,370,617**

## SYNCHRONIZATION EXTRACTOR RESPONSIVE TO DIGITAL SIGNALS

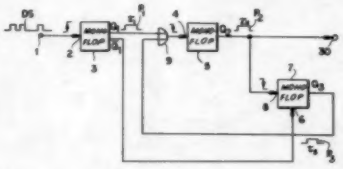
**Dieter Brandt, St. Johann, Fed. Rep. of Germany, assignor to Wandel & Goltermann GmbH & Co., Muhleweg, Fed. Rep. of Germany**

**Filed Aug. 15, 1980, Ser. No. 178,384**

**Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933322**

**Int. Cl.³ H03K *1/17*; H03B *1/00***

**U.S. Cl. 328—63** **8 Claims**



1. A synchronization extractor responsive to an incoming digital signal subject to phase jitter appearing on an input terminal thereof and including high-voltage pulses which last less than a predetermined mean bit period, comprising:

pulse-shaping means connected to said input terminal for receiving said incoming signal and emitting a start pulse of a duration less than said mean bit period in response to a high-voltage pulse of said signal; and

pulse-generating means with a pulse-repetition frequency substantially corresponding to the reciprocal of said means bit period, said pulse-generating means being connected to said pulse-shaping means for instant inhibition by a leading edge and instant retriggering by a trailing edge of each start pulse, thereby emitting a train of sync pulses recurring substantially at said mean bit period while closely following minor phase shifts undergone by the bits of said incoming signal.

---

**4,370,618**

## CIRCUIT FOR RECOGNIZING CYCLICALLY OCCURRING PULSE SEQUENCES

**Michael J. Walker, West Midlands, England, assignor to Lucas Industries Limited, Birmingham, England**

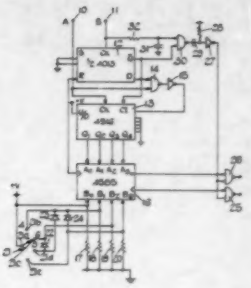
**Filed May 21, 1980, Ser. No. 152,121**

**Claims priority, application United Kingdom, May 25, 1979, 791388**

**Int. Cl.³ H03K *5/19, 21/30, 21/36***

**U.S. Cl. 328—120** **4 Claims**

1. A circuit for distinguishing specific pulse patterns in a pulse train comprising input means from a detecting means for detecting specific events in the pulse train, a counter, a logic circuit connected to said input means and to said counter and controlling said counter so as to commence counting of the pulses in the pulse train when said logic circuit receives an input from said detecting means and to stop counting either when the next input is received from said detecting means or when a predetermined count has been reached, whichever occurs first, and comparison means connected to the counter output and providing an output signal when the number of pulses counted by the counter on receipt of the next input from



the detecting means is less than the predetermined count by one count.

---

**4,370,619**

## PHASE COMPARISON CIRCUIT ARRANGEMENT

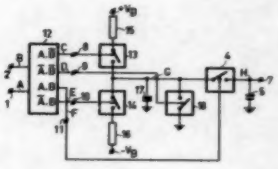
**Albert M. A. Rijckaert, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 10, 1980, Ser. No. 168,841**

**Claims priority, application Netherlands, Jul. 17, 1979, 7905541**

**Int. Cl.³ H03D *13/00*; H03K *19/21, 5/26***

**U.S. Cl. 328—133** **6 Claims**

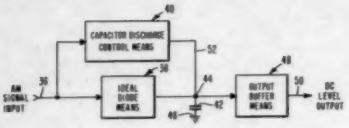


1. A phase comparison circuit for measuring the phase difference between first and second pulse trains comprising, first and second inputs for receiving said first and second pulse trains, respectively, a capacitor, first and second switchable current sources having outputs connected to said capacitor, a switchable constant voltage source connected to said capacitor, a sampling circuit coupled to said capacitor, and a control circuit having input means coupled to said first and second inputs and output means coupled to switching signal inputs of said current sources, said constant voltage source and said sampling circuit, said constant voltage source being arranged to produce, when activated, an output voltage which lies between the open circuit output voltages of said first and second current sources, said control circuit being responsive to first and second pulse trains applied to said first and second inputs, respectively, by (a) activating said first current source for periods when a pulse of the first pulse train is present while a pulse of the second pulse train is absent, (b) activating said second current source for periods when a pulse of the second pulse train is present while a pulse of the first pulse train is absent, (c) activating said constant voltage source each time pulses of the first and second pulse trains are absent simultaneously, and (d) activating said sampling circuit each time pulses of the first and second pulse trains are present simultaneously.

## 4,370,620
## EFFICIENT HIGH PERFORMANCE ENVELOPE DETECTOR WITH CONTROLLED DECAY ENVELOPE DETECTION

**Lucas K. Tin, Fremont, CA, assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Oct. 29, 1980, Ser. No. 201,851**
**Int. Cl.³ H03D** *1/10, 1/18*
**U.S. Cl. 329—192** **9 Claims**




1. An envelope detector for generating a DC level representing the amplitude of the envelope of an amplitude modulated input signal comprising;

means for supplying the input signal as a charging signal;

capacitor means responsive to the charging signal; and

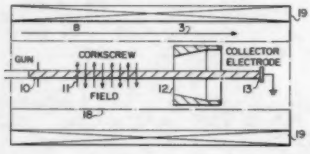
discharge control means for providing an increasing discharge current through a discharge path for said capacitor means for a selected time period of the input signal.

---

## 4,370,621
## HIGH EFFICIENCY GYROTRON OSCILLATOR AND AMPLIFIER

**Phillip A. Sprangle, Silver Spring, Md.; Robert A. Smith, Washington, D.C., and Kwo R. Chu, Annandale; Michael E. Read, Vienna, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 11, 1980, Ser. No. 129,294**
**Int. Cl.³ H01S** *4/00*
**U.S. Cl. 330—4** **5 Claims**




1. In a relativistic electron cyclotron maser having a cavity resonator positioned in an axial magnetic field to receive therethrough a spiralling beam of electrons for producing stimulated emission of radiation by the electrons at the frequency of a wave mode supported by the cavity resonator, the beam of electrons passing through a phase-bunching region and an energy extraction region in the cavity resonator,

efficiency-enhancement means for setting a bunching parameter $\alpha$ to a value much less than unity in the phase-bunching region of the cavity resonator to maximize the phase-bunching of electrons in the beam, and for causing the bunching parameter $\alpha$ to increase in the energy-extraction region of the cavity resonator so that the bunched electrons in the beam reach their minimum energies at the same time, wherein the bunching parameter

$$\alpha = \frac{\epsilon c}{2r_o\Delta\omega}$$

and wherein:

$\epsilon$=dimensionless ratio of the cavity-wave-mode, electric field amplitude E to the magnetic field amplitude B at the entrance to the resonator

$c$=speed of light ($2.998\times10^{10}$ cm sec$^{-1}$)

$r_o$=Larmor radius of the electrons at the entrance to the resonator in cm.

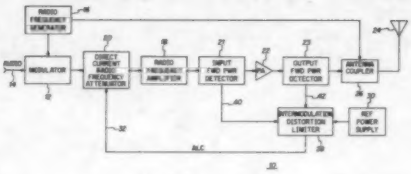
$\Delta\omega$=frequency mismatch between the Doppler-shifted cavity wave mode and the cyclotron frequency of the electrons, in sec$^{-1}$.

---

## 4,370,622
## IMD LIMITER

**Sherman J. Hornbeck, Cedar Rapids, Iowa, and Jack C. Thornton, Satellite Beach, Fla., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Mar. 23, 1981, Ser. No. 246,455**
**Int. Cl.³ H03G** *3/00, 11/00;* **H04B** *1/04*
**U.S. Cl. 330—207 P** **14 Claims**




1. An intermodulation distortion limiter for controlling the ratio of average power to peak envelope power in an output signal from a power amplifier comprising:

control means, responsive to a control signal, for controlling the amplitude of an input signal applied to the power amplifier, the input signal having associated therewith, when applied to the power amplifier, an average power and a peak envelope power;

first detector circuit means for detecting the difference between the peak envelope power and the average power of the input signal to provide a first reference signal thereby;

selectable reference source for providing first and second selectable reference signals:

reference generator means for generating a second reference signal that is responsive to the first reference signal and the first selectable reference signal;

second detector circuit means for comparing the peak envelope power of the output signal and the second selectable reference signal to obtain a first analog representation of the peak envelope power difference thereby;

third detector circuit means for detecting the difference between the average power of the output signal and the second reference signal to obtain a second analog representation of the average power difference; and

combination means for combining the first and second analog representations to obtain the control signal to which the control means is responsive.

---

## 4,370,623
## PUSH-PULL AMPLIFIER CIRCUIT

**Hideki Nagasawa, Nagaoka, Japan, assignor to Kabushiki Kaisha Nagasawa, Nagaoka, Japan**

**Continuation of Ser. No. 71,865, Sep. 4, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,183**
**Claims priority, application Japan, Sep. 14, 1978, 53-113917**
**Int. Cl.³ H03F** *3/26*
**U.S. Cl. 330—267** **16 Claims**

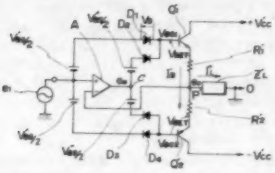
1. An amplifier comprising:

(a) means for supplying an input signal to said amplifier;

(b) a push-pull amplifier including first and second complementary transistors having respective output terminals connected together at a first junction, said first junction being connected to a load;

(c) a DC amplifier having a non-inverting input terminal and an inverting input terminal, said means for supplying an input signal being connected to said non-inverting input terminal, said first junction being connected to said inverting input terminal;

(d) a first biasing power supply circuit having first and second halves operative together to produce a predetermined first potential and a first biasing current, a first junction at first terminals of said first and second halves being connected to said first and second transistors respectively, a second junction at second terminals of said first and second halves, each of said first and second halves being operative to establish half of said first potential at said first terminals thereof, said means for supplying an input signal being connected to second junction;



(e) a second biasing power supply circuit having third and fourth halves operative together to produce a predetermined second potential and a second biasing current, a third junction at first terminals of said third and fourth halves, each of said third and fourth halves being operative to establish half of said second potential at second terminals thereof, said DC amplifier having an output connected to said third junction, and;

(f) means responsive to an output of said DC amplifier for applying the first predetermined potential to the base of said first transistor and applying the second predetermined potential to the base of said second transistor, or conversely effecting the same, to produce a bias current in said push-pull amplifier which balances one half of said first potential with a potential at said first junction.

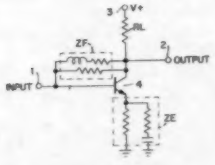
---

**4,370,624**

## LOW NOISE AMPLIFIER CIRCUIT WITH REDUCED LOW-FREQUENCY GAIN

**Tadao Ogawa, Hino, and Nobuhide Yamaguchi, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 28, 1980, Ser. No. 211,050**
**Claims priority, application Japan, Nov. 28, 1979, 54-154035**
**Int. Cl.³ H03F *1/34***
**U.S. Cl. 330—294** **5 Claims**



1. A low noise amplifier circuit, comprising:

a transistor comprising base, emitter, and collector terminals;

an input terminal connected to said base terminal;

an output terminal connected to said collector terminal;

a load resistor connected to said output terminal;

a first impedance element connected between said base and collector terminals, having a zero, a pole and an impedance with a first constant low value at low frequencies, a second constant high value at high frequencies and increasing smoothly between the first constant low value and the second constant high value over an intermediate range of frequencies; and

a second impedance element connected between said emitter terminal and ground, having a zero, a pole and an impedance with a first constant high value at the low frequencies, a second constant low value at the high frequencies and decreasing smoothly between the first constant high value and the second constant low value over the intermediate range of frequencies,

the zero of said first impedance element coincides approximately with the pole of the second impedance element and the pole of the first impedance element coincides approximately with the zero of the second impedance element, and

the first constant low value of said first impedance element is greater than the first constant high value of said second impedance element.

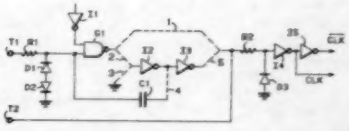
---

**4,370,625**

## INTEGRATED CIRCUIT HAVING ELEMENTS FOR SELECTIVELY FORMING AN RC OR A CRYSTAL OSCILLATOR

**Ashok H. Someshwar, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 7, 1981, Ser. No. 223,183**
**Int. Cl.³ H03B *5/20, 5/32***
**U.S. Cl. 331—49** **6 Claims**



1. An integrated circuit having a plurality of circuit elements comprising:

a first terminal and a second terminal;

a first inverter having an input coupled to the first terminal, a second inverter, and a third inverter; and

a capacitor;

wherein the circuit elements are interconnected by one of a first or a second process step; and

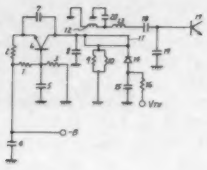
wherein an RC oscillator is provided in response to a resistor being coupled between the first and second terminals, and in response to an output of the first inverter being coupled to an input of the second inverter, an output of the second inverter being coupled to an input of the third inverter, an output of the third inverter being coupled to the second terminal, and the capacitor coupled between the input of the first inverter and the output of the second inverter by the first process step; or

wherein a crystal oscillator is provided in response to a crystal being coupled between the first and second terminals, and in response to the output of the first inverter being coupled to the second terminal by the second process step.

## 4,270,626
## OUTPUT COUPLING CIRCUIT FOR LC LOCAL OSCILLATOR

Susumu Ushida, Soma, Japan, assignor to Alps Electric Co. Ltd., Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 175,953
Claims priority, application Japan, Aug. 8, 1979, 54-109059[U]
Int. Cl.³ H03B 5/12, 5/18
U.S. Cl. 331—96 2 Claims

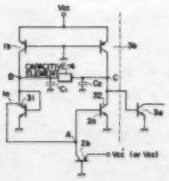


1. In a local oscillator circuit including:
a local oscillator having a conductive element receiving oscillating energy from said local oscillator;
means for receiving oscillating energy from said conductive element, said receiving means including a pickup coil disposed in the vicinity of said conductive element so as to be inductively coupled thereto; and
a capacitor connected between said pickup coil and ground;
the improvement wherein said capacitor is connected to a portion of said pickup coil and ground, and the values of said capacitor and said portion of said pickup coil connected to ground therethrough are selected so that said capacitor and said portion of said pickup coil will resonate at frequencies higher than those frequencies in the frequency band generated by said local oscillator.

## 4,270,627
## INTEGRATED INJECTION LOGIC AMPLIFIER AND OSCILLATOR CIRCUITS

Kenji Kaneko, Hachioji, and Takahiro Okabe, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 922,370, Jul. 6, 1978, Pat. No. 4,233,574.
This application Mar. 31, 1980, Ser. No. 135,669
Claims priority, application Japan, Jul. 15, 1977, 52-84278; Mar. 24, 1978, 53-33051; May 19, 1978, 53-66547
Int. Cl.³ H03F 3/195, 3/18; H03B 5/36
U.S. Cl. 331—108 D 10 Claims



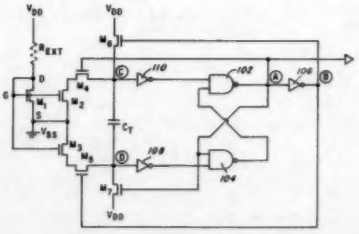
6. A circuit comprising an amplifier having a first transistor which has a first load transistor connected to a collector thereof, a second transistor which has a second load transistor connected to a collector thereof, means for transmitting a collector output of said first transistor to a base of said first transistor, means for transmitting a collector output of said first transistor to a base of said second transistor, an input terminal connected to a base of said first transistor, and a first output terminal connected to a collector of said second transistor, wherein said first transistor has a first collector connected to a third load transistor and a second collector connected to said first load transistor, and said collector output of said first transistor is directly transmitted to said base thereof from said first collector, and further comprising a capacitive element which is connected between said input terminal and said first output terminal, so that a collector output of said second transistor is fed back to a base of said first transistor so that said circuit operates as an oscillator, wherein current gains of said first transistor and said second transistor are made different thereby to make a collector current of said second transistor and a collector current of said second load transistor substantially equal thereby to shorten the oscillator start-up time.

10. A circuit comprising an amplifier having a first transistor which has a first load transistor connected to a collector thereof, a second transistor which has a second load transistor connected to a collector thereof, means for transmitting a collector output of said first transistor to a base of said first transistor, means for transmitting a collector output of said first transistor to a base of said second transistor, an input terminal connected to a base of said first transistor, and a first output terminal connected to a collector of said second transistor, wherein said first transistor has a first collector connected to a third load transistor and a second collector connected to said first load transistor, and said collector output of said first transistor is directly transmitted to said base thereof from said first collector, said circuit further comprising a first bias connection terminal coupled to the emitter of the first load transistor for connection to a first bias source having a first polarity, and second bias connection terminals coupled to the emitters of the second and third load transistors for connection to a second bias source having said first polarity, wherein the voltage levels for said first and second bias sources and the characteristics of said transistors are set so that when the bias sources are coupled to said respective bias connection terminals and an input signal is provided to the input terminal, the base of the second transistor is biased to a point to provide an amplified output at said output terminal,
wherein said first and second bias sources have different voltage levels to cause different currents through said load transistors to produce said amplified output.

## 4,270,628
## RELAXATION OSCILLATOR INCLUDING CONSTANT CURRENT SOURCE AND LATCH CIRCUIT

Alva Henderson, and Douglas B. Hoy, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 17, 1980, Ser. No. 207,312
Int. Cl.³ H03K 3/282
U.S. Cl. 331—111 2 Claims



1. A self compensating oscillator circuit comprising:
a cross-coupled, set-reset latch circuit, having first and second input terminals and an output terminal;
means connected to the output terminal for providing an inverted output;
a timing capacitor connected across the input terminals;
first, second, and third field-effect transistors, the drain of the first transistor being connected in common with the gates of the first, second, and third transistors;
a first voltage source connected to the drain of the first transistor;

a second voltage source connected to the sources of the first, second and third transistors;

a fourth field-effect transistor connecting the drain of the second transistor to the first input terminal of the latch circuit, the gate of the fourth transistor being connected to the latch output;

a fifth field-effect transistor connecting the drain of the third transistor to the second input terminal of the latch circuit, the gate of the fifth transistor being connected to the inverted latch output;

a third voltage source;

a sixth field-effect transistor connecting the first input terminal to the third voltage source, the gate of the sixth transistor being connected to the inverted latch output; and

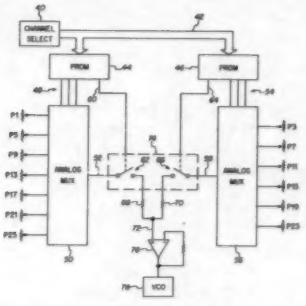
a seventh field-effect transistor connecting the second input terminal to the third voltage source, the gate of the seventh transistor being connected to the latch output.

---

## 4,370,629
## VOLTAGE CONTROLLED OSCILLATOR WITH REDUCED NUMBER OF TUNING POTENTIOMETERS

**Thomas F. Martin, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Nov. 3, 1980, Ser. No. 203,789**
**Int. Cl.³ H03B *1/00*; H03J *5/00***
**U.S. Cl. 331—179** **6 Claims**




1. In a voltage supply system for a VCO (Voltage Controlled Oscillator) generating N preset frequencies in accordance with N input VCO tuning voltages, the improvement comprising:

a plurality of (N/2)+1 separate dedicated reference voltages, and means for generating said N input VCO tuning voltages from said reference voltages, including switch means for applying predetermined combinations of said reference voltages as said input VCO tuning voltages, a different one of the reference voltages being applied for each odd numbered one of said input VCO tuning voltages, the remaining even numbered ones of said input VCO tuning voltages being equal to one-half the sum of adjacent said reference voltages.

---

## 4,370,630
## ISOLATING CONNECTOR

**Raymond G. Capek, Elmhurst, and Elgie E. Garrett, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.**

**Filed May 18, 1981, Ser. No. 264,924**
**Int. Cl.³ H03H *7/01***
**U.S. Cl. 333—24 C** **3 Claims**

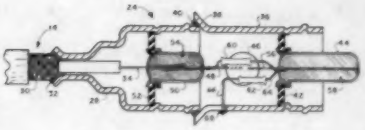
1. In a cable having an outer shield surrounding an inner conductor, and having a connector on one end of the shield which capacitively isolates the shield to prevent conduction of DC and low frequency AC currents in the shield, an isolator for the cable's center conductor, comprising:

a connector plug having a generally tubular shell, one end of which is adapted to connect electrically to the cable's shield and to receive the shield's inner conductor inside the shell, and an opposite end which is adapted to mate with a female plug;

a connector pin;

means for supporting the connector pin within the shell while electrically isolating the pin from the shell so that the pin extends from said opposite end of the shell;

a capacitance disposed within the shell and electrically connected in series with the connector pin and the cable's inner conductor;



a first bleeder resistance disposed within the shell and electrically connected in parallel with said capacitance; and

a second bleeder resistance disposed within the shell and electrically connected in series with the shell and the connector pin,

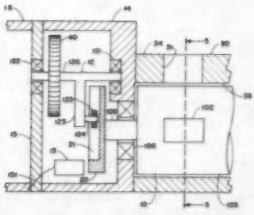
whereby the cable's inner conductor and the connector pin are isolated from each other for DC and low frequency AC currents while higher frequency AC currents are coupled from the pin to the inner conductor, and the capacitance coupled to the inner conductor and the cable's shield is provided with bleeder resistance.

---

## 4,370,631
## WAVEGUIDE SWITCH

**Robert L. Gerber, and Larry C. Raper, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 22, 1981, Ser. No. 227,337**
**Int. Cl.³ H01P *1/10***
**U.S. Cl. 333—106** **10 Claims**



1. A waveguide switch for selectively diverting electromagnetic energy among a plurality of connected waveguides in response to a switching command comprising:

a rotor housing having a plurality of waveguide ports connected to waveguides and a cylindrical void communicating to the ports;

a rotor rotatably mounted within said cylindrical void for diverting electromagnetic energy among the ports, having waveguide bends therein which are selectively aligned with the ports in said rotor housing;

biasing means for selectively rotating said rotor, said biasing means including,

a Geneva wheel connected to said rotor,

a driving guide engaged by said Geneva wheel for providing a driving engagement therewith,

first and second electromechanical transducers mechanically coupled to said driving guide for providing torque

thereto to selectively rotate or break the rotation for said rotor;

electrical power means for supplying driving and braking electrical currents to said first and second electromechanical transducers of said biasing means; and

control circuit means responsive to the switching command, for providing signals to said electrical power means for determining the sequence of driving and braking electrical currents applied to said first and second electromechanical transducers, whereby rotation of said rotor is effected without bounce.

---

## 4,370,632

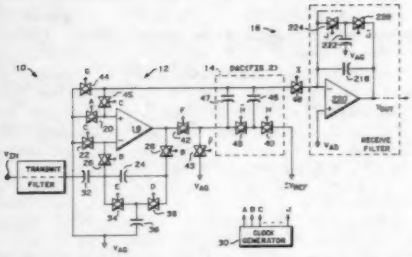
## MULTIPLE FUNCTION OPERATIONAL AMPLIFIER CIRCUIT

**Robert N. Allgood; Stephen H. Kelley; Richard W. Ulmer, all of Austin, and Henry Wurzburg, Round Rock, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed May 8, 1981, Ser. No. 261,848**

**Int. Cl.³ H03H *11/12*; H03F *1/34***

**U.S. Cl. 333—173** **8 Claims**



1. A circuit for providing sample and hold and comparator functions with only one operational amplifier and inherently achieving auto-zeroing comprising:

an operational amplifier having inverting and non-inverting inputs and an output;

input capacitance means having a first plate coupled to an input terminal, and a second plate;

first switching means for selectively connecting the second plate of the input capacitance means to the inverting input of the operational amplifier;

feedback capacitance means having a first plate connected to the input capacitance means, and a second plate;

second switching means for selectively connecting the output of the operational amplifier to the second plate of the feedback capacitance means; and

third switching means for selectively connecting the non-inverting input of the operational amplifier to a reference voltage whereby a sample of an input signal applied to the input terminal is applied to the feedback capacitance means and held thereon.

---

## 4,370,633

## ACOUSTIC WAVE BANDPASS ELECTRICAL FILTERS

**John Schofield, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.**

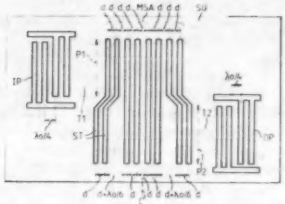
**Filed Feb. 20, 1981, Ser. No. 236,357**

**Claims priority, application United Kingdom, Jan. 19, 1981, 8101527**

**Int. Cl.³ H03H *9/64, 9/145***

**U.S. Cl. 333—195** **8 Claims**

1. In an acoustic wave bandpass electrical filter including a substrate able to propagate acoustic waves at a surface thereof, input transducing means arranged to launch acoustic wave energy along a first propagation track at said surface, output transducing means arranged to receive acoustic wave energy from a second propagation track at said surface, and electrical coupling means arranged on said surface so as to receive acoustic wave energy from the input transducing means in the first track and to relaunch at least part of that energy as acoustic wave energy towards the output transducing means in the second track, in which the combined amplitude-frequency response of the input and output transducing means has a first frequency passband which is substantially the desired passband of the filter and further frequency passbands having a harmonic relationship to said first passband, said coupling means comprising an array of conducting strips across the first track and an array of conducting strips across the second track, the conducting strips of each array being discrete parallel strips



electrically insulated from each other and strips of the two arrays being electrically connected in pairs with each pair including one strip from each array, the improvement wherein the strips of the coupling means are arranged in at least one first group, the first group comprising three sub-groups and each sub-group comprising strips from both arrays, the sub-group spacing in the first track being different from the sub-group spacing in the second track, and the composition of the three sub-groups of the first group and their separation along the first and second tracks being selected to provide a stopband in the amplitude-frequency response of the coupling means which suppresses a selected said further passband.

---

## 4,370,634

## CIRCUIT BREAKER

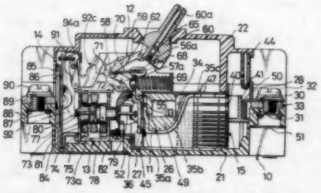
**Hideya Kondo; Youichi Yokoyama; Youichi Aoyama, and Tamotsu Mori, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed May 14, 1981, Ser. No. 263,487**

**Claims priority, application Japan, May 20, 1980, 55-67306**

**Int. Cl.³ H01H *75/00, 77/00, 83/00***

**U.S. Cl. 335—16** **5 Claims**



1. A circuit breaker comprising a housing, a manual contact opening and closing mechanism including a handle extending from said housing and a link operatively coupled to said handle, said mechanism being made operative through the handle by locking a tripping member to the mechanism while being made inoperative by releasing said tripping member, a movable contactor having a movable contact and capable of being rocked by the manual contact opening and closing mechanism, a fixed contactor having a fixed contact with which said movable contact is engageable, means for resiliently biasing said movable contactor to be separated from said fixed contactor,

an arc suppressing means including a deion grid assembly, a first arc running plate extending from the fixed contactor and a second arc running plate extending from a position adjacent both the fixed and movable contactors to a position adjacent a free end of said first arc running plate, said first arc running plate having a lower portion disposed parallel to said second arc running plate and in facing relationship therewith, said lower portion of said first arc running plate and said second arc running plate arranged to conduct arc currents in mutually opposite directions and being spaced apart sufficiently to prevent short-circuiting therebetween and close enough to generate therebetween a magnetic force which drives an arc toward said deion grid assembly, said first arc running plate further including an upper portion opposed to the second arc running plate in a wider spaced relation thereto and an intermediate portion extended diagonally between said lower and upper portions, said deion grid assembly being arranged in said wider space, and a tripping means for releasing said tripping member from the manual contact opening and closing mechanism so as to separate the movable contactor from the fixed contactor at least by a force of said biasing means in response to an excess current.

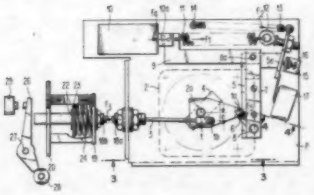
---

**4,370,635**

## UNDERVOLTAGE RELEASE DEVICE FOR A CIRCUIT BREAKER

**John T. Carroll, Cary, N.C., and Miguel B. Yamat, Franklin, Wis., assignors to Siemens-Allis, Inc., Atlanta, Ga.**

**Filed Sep. 29, 1980, Ser. No. 191,535**
**Int. Cl.³ H01H *73/00, 83/00***
**U.S. Cl. 335—20** **25 Claims**



1. An undervoltage release device for a circuit breaker, comprising:

(a) a solenoid for sensing and undervoltage, said solenoid having a plunger and exercising a holding force on said plunger when energized by a control voltage, said plunger being movable between an attacted position in the presence of said control voltage and a released position in the presence of an undervoltage condition;

(b) a trip spring for storing energy and for discharging said energy for tripping said circuit breaker;

(c) an electric charging motor;

(d) means for coupling said motor to a source of electric current;

(e) driving means operably coupled to said charging motor, said driving means upon rotation of said motor being moved by said motor from a tripped position towards a stand-by position;

(f) connection means mechanically coupling said trip spring to said driving means for charging said trip spring in response to movement of said drive means;

(g) movable blocking means for stopping and holding said driving means in said stand-by position;

(h) a coil spring coupled between said plunger and said driving means, said coil spring being charged by movement of said driving means to said stand-by position in counteraction to the holding force of said plunger; and

(i) releasing means coupled to said plunger and movable thereby from a first position to a second position for moving said blocking device to thereby release said driving means from its stand-by position;

whereby movement of said plunger from said attracted position to said released position frees said driving means from its stand-by position, thereby releasing said trip spring.

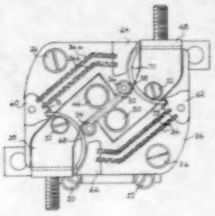
---

**4,370,636**

## ELECTROMAGNETIC DUAL BREAK CONTACTOR

**John R. VanPatten, Waynesboro, Va., assignor to General Electric Company, Salem, Va.**

**Filed Apr. 3, 1981, Ser. No. 250,825**
**Int. Cl.³ H01H *67/02***
**U.S. Cl. 335—132** **13 Claims**



1. Dual break electrical contactor structure comprising:

(a) an insulative base member;

(b) a first conductor attached to a surface of said base member, said first conductor having an end terminating on said surface, a finite portion of said first conductor approaching said end being substantially straight;

(c) a second conductor attached to said surface of said base member, said second conductor having an end terminating on said surface, a finite portion of said second conductor approaching said end thereof being substantially straight, said finite portion of said first conductor approaching said end thereof from a first direction and said finite portion of said second conductor approaching said end thereof from a second direction directly opposed to said first direction, each of said finite portions being spaced from but parallel to and overlapping the other of said finite portions in the plane of said surface;

(d) first and second contact tips mounted respectively on said first and second conductors adjacent their parallel overlapping finite portions;

(e) a conducting contact carrying bridge having a contact tip on each end thereof, each contact tip being positioned for mating with a corresponding one of said first and second contact tips on said first and second conductors, respectively; and,

(f) means for causing said bridge to move between a non-contacting and a contacting position with said conductors whereby a current path may be formed between said first and second conductors when said bridge is in a contacting position and said current path is interrupted when said bridge is in said non-contacting position.

---

**4,370,637**

## MAGNETIC ACTUATOR

**Lucien Siffroi, Versailles, France, assignor to La Telemecanique Electrique, France**

**Filed Mar. 31, 1980, Ser. No. 135,377**
**Claims priority, application France, Mar. 30, 1979, 79 08029**
**Int. Cl.³ H01H *9/00***
**U.S. Cl. 335—174** **3 Claims**

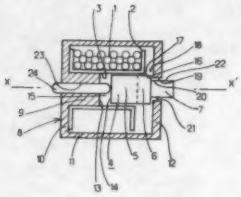
1. An actuator comprising:

(i) an energizing winding,

(ii) a magnetisable core axially movable with respect to said winding into a rest position and a working position, said core including a first portion and a second portion and a third portion disposed axially between said first and third

portions, said first portion being always within said winding and said second and third portions being at least partially externally of said winding when in said rest position,

(iii) a magnetisable field structure adapted to become magnetised upon current flow in said energizing winding, said field structure including a portion positioned within the winding and presenting a first polar surface spaced, in the rest position of the core, by a first axial gap from the first core portion, said field structure extending about the winding and presenting a second polar surface spaced by a second and radial gap from said second portion of the



core and a third polar surface spaced by a third and axial gap from said third portion of the core, said third gap being in the rest position of the core of less width than said first gap, said magnetisable core normally being held in said rest position by the magnetic flux passing through the second and third gaps, when the intensity of the said current flow is under a predetermined value, whereas the said magnetisable core is moved to the said second position by the magnetic flux passing through the first gap, as soon as the intensity of the said current flow exceeds the said predetermined value.

---

**4,370,638**

## DOUBLE-FUNCTION SOLENOID OPERATED SWITCH

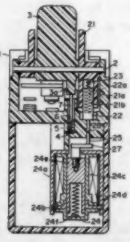
**Nobuhiro Takeda; Shigeo Mizuno; Masaichi Hattori, and Yukio Takaishi, all of Aichi, Japan, assignors to Tokai Rika Co., Ltd., Aichi, Japan**

**Filed May 18, 1981, Ser. No. 264,784**

**Claims priority, application Japan, May 19, 1980, 55-67431[U]**

**Int. Cl.³ H01H *45/02, 3/20***

**U.S. Cl. 335—186** **3 Claims**



1. A double-functional solenoid-operated switch comprising:

a frame;

an automatic knob pivotally coupled to said frame;

a sliding rod inserted in a hole formed in said automatic knob;

a first spring inserted in said hole to urge said sliding rod toward an opening of said hole;

a moderating plate having on its top a notch over which said sliding rod slides;

a detent plate on which said sliding rod slides along, said detent plate having a moderating portion which holds said sliding rod together with said moderating plate and being installed in said frame so as to slide freely in the axis direction of said sliding rod; and

a solenoid having a second spring which continuously urges said detent plate toward the axis direction of said sliding rod through a core.

---

**4,370,639**

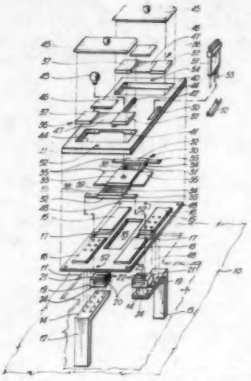
## HIGH CAPACITY CHANGE-OVER POWER SUPPLY FUSE

**Guy Vallee, Ste. Catherine, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Feb. 23, 1981, Ser. No. 236,755**

**Int. Cl.³ H01H *85/26***

**U.S. Cl. 337—230** **9 Claims**



1. A high capacity change-over power supply fuse, comprising:

an incoming bus and an outgoing bus, spaced laterally;

a support member extending over said buses, and two apertures in the support member in lateral alignment, an aperture over each bus;

a contact member mounted on each bus and projecting through said apertures in the support member;

a fuse element holder mounted on said support member to slide longitudinally, in either of two directions, relative to said contact members, said holder including two fuse element mounting positions spaced apart along the holder, a mounting position on either side of said contact members;

a cover over said support member and said holder, said cover having two apertures spaced apart, one on each side of said contact members, and positioned such that when one of said fuse element mounting positions is between said contact members the other of said fuse element mounting positions is beneath one of said apertures in said cover for access thereto;

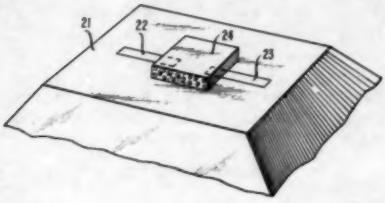
means extending through said cover for sliding said fuse element holder longitudinally in either of said directions, movement in one direction positioning a first fuse element in a first said mounting positions in contact with said contact members and positioning a second fuse element in a second of said mounting positions under one of said apertures in said cover, movement in the other direction positioning said second fuse element in contact with said contact members and positioning said first fuse element under the second of said apertures in said cover, a fuse element positioned under either of the apertures in the cover capable of being removed, and replaced, without exposure to busses or contact members.

4,370,640

## METAL-SEMICONDUCTOR THERMAL SENSOR

Robert C. Dynes, Summit, N.J., and John M. Mochel, Champaign, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 10, 1980, Ser. No. 186,004
Int. Cl.[3] H01C 7/04
U.S. Cl. 338—25 26 Claims




1. A thermal energy sensing device comprising a metal-semiconductor body in contact with spaced electrical conducting leads,

characterized in that said body comprises regions selected from the group consisting of metallic and intermetallic dispersed in a semiconductor matrix, wherein the resistivity of said body is greater than 300 microhm-centimeters at 20 degrees C., and the conductivity of said body is less than 50 $(\text{ohm-cm})^{-1}$ at 4.2 degrees kelvin.

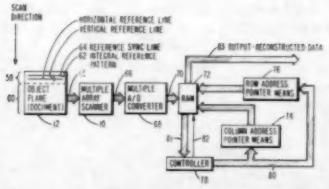
---

4,370,641

## ELECTRONIC CONTROL SYSTEM

Sherwood Kantor, Longmont, Colo.; Randall A. Maddox, Lexington, Ky., and Paul S. Yosim, Lafeyette, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1979, Ser. No. 66,740
Int. Cl.[3] G06K 9/32
U.S. Cl. 340—146.3 H 23 Claims




1. Method to automatically correct abutment, alignment and skew in the composite image of a continuous object being reproduced by the arrays of a multiple array scanner, said method comprising the steps of:

generating an electronic image of a test pattern;

analyzing the electronic image to obtain an alignment error, an abutment error and a skew error;

storing the errors; and

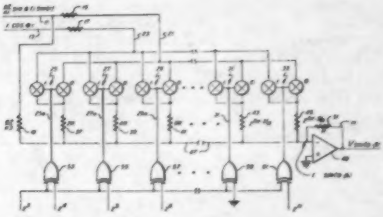
correlating the errors with the composite electronic image of the continuous object to generate thereafter a continuous image of the continuous object.

4,370,642

## SINGLE NON-LINEAR CONVERTER LADDER NETWORK HAVING ANALOG SWITCHES WITH DIGITAL CONTROL

Edward C. Costello, Scarsdale, N.Y., and David J. Simon, Glen Rock, N.J., assignors to The Singer Company, Little Falls, N.J.

Continuation of Ser. No. 47,180, Jun. 8, 1979, abandoned, which is a continuation of Ser. No. 853,342, Nov. 21, 1977, Pat. No. 4,164,729. This application Nov. 24, 1980, Ser. No. 209,454
The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.
Int. Cl.[3] G05B 1/00; H03K 13/02; G08C 9/00
U.S. Cl. 340—347 SY 3 Claims



1. An improved ladder network for simultaneous implementation of nonlinear sine and cosine functions having the general form $K_1N/(1+K_1N)$ in a converter comprising:

(a) a plurality of binarily weighted resistors;

(b) a first analog signal line connected in common to one end of all said resistors;

(c) a plurality of single pole double throw analog switches equal in number to the number of resistors in said plurality, each having a common terminal, a normally open terminal, a normally closed terminal and a control input, the common terminals connected to respective ones of said plurality of resistors;

(d) means for coupling the bits of a digital word representative of an angle to the respective control inputs of said switches;

(e) an analog sine signal line connected through a first resistor to the normally open terminals of all of said switches; and

(f) an analog cosine signal line connected through a second resistor to the normally closed terminals of all of said switches.

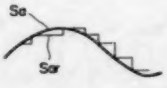
---

4,370,643

## APPARATUS AND METHOD FOR COMPRESSIVELY APPROXIMATING AN ANALOG SIGNAL

Masatsugu Kitamura, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 5, 1981, Ser. No. 260,806
Claims priority, application Japan, May 6, 1980, 55-59638
Int. Cl.[3] H03K 13/00
U.S. Cl. 340—347 SH 25 Claims




1. Apparatus for compressively approximating an analog signal comprising:

(a) first means for sampling and holding the amplitude of said analog signal in response to a sampling signal;

(b) second means for producing a first signal indicative of the

difference between the amplitude of said analog signal and the amplitude of an output signal from said first means;

(c) third means for producing a second signal indicative of the average amplitude of said analog signal around an instant at which said analog signal has been sampled;

(d) fourth means for producing a third signal when said first signal has a given relationship with respect to said second signal; and

(e) fifth means for producing said sampling signal in response to said third signal.

---

4,370,644

## ALARM DEVICE FOR A DOOR, AUTOMATICALLY SWITCHED OFF DURING A LICIT ACCESS

Serge-Andre Droz, 14 avenue du Lignon, 1219 Le Lignon, Switzerland

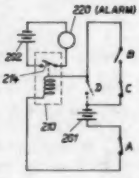
PCT No. PCT/CH80/00012, § 371 Date Oct. 1, 1980, § 102(e) Date Sep. 29, 1980, PCT Pub. No. WO80/01617, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 31, 1980, Ser. No. 252,977

Claims priority, application Switzerland, Feb. 1, 1979, 991/79

Int. Cl.³ G08B *13/08, 23/00*

U.S. Cl. 340—528 9 Claims




1. An alarm device for a door having a lock including a retractable bolt, which device is automatically switched off during a licit access, said alarm device comprising a control circuit including, in series, an electric power source, and first, second and third switches, the first and the second switches being respectively closed and open when the door is closed and, conversely, open and closed when the door is fully open, and simultaneously closed during opening and closing of the door, said retractable bolt on said door functioning for locking and unlocking the door, means coupling said bolt to said third switch whereby said third switch is closed except when the bolt is retracted, a relay interconnected with said switches and actuated upon the simultaneous closing of the three switches, and an alarm circuit connected with said relay and operated when the relay is actuated.

---

4,370,645

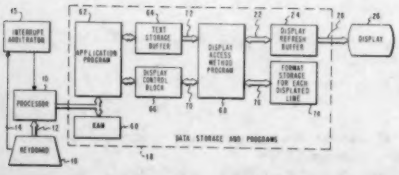
## GHOST CURSOR IN DISPLAY ALL CODES MODE

William C. Cason, Austin; Ward A. Kuecker, Round Rock, and Susan D. Stratton, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,047

Int. Cl.³ G09G *1/02*

U.S. Cl. 340—709 11 Claims




1. In a text display system operable in an all codes mode for displaying a frame of text and control codes including a text cursor adjacent a text code, control code, or display position at which a text processing operation can next be effected relative to text and control codes stored in a text storage buffer, the improvement comprising:

first means, while in said all codes mode, for determining a hidden codes mode position on the display screen associated with a current position of said text cursor; and

second means, while in said all codes mode, for displaying a ghost cursor at said hidden codes mode position.

---

4,370,646

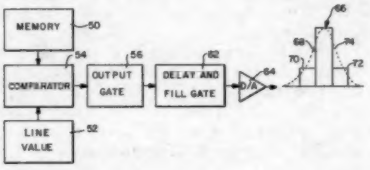
## METHOD AND MEANS FOR CONTROLLING ELECTRON BEAM IN A RASTER SCAN MONITOR

John E. Mahony, Sacramento, Calif., assignor to General Electric Company, Rancho Cordova, Calif.

Filed Nov. 3, 1980, Ser. No. 203,654

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—722 5 Claims




1. In a raster scan display system in which electron beam energization during a raster line scan is controlled by comparing a raster line value to stored magnitude digital data as a raster line is scanned, the method of generating a control signal for energizing the electron beam comprising the steps of

generating a first pulse when said raster is to be illuminated,

generating a second pulse preceding said first pulse,

generating a third pulse succeeding said first pulse, and,

applying said first, second, and third pulses to digital to analog converter circuitry whereby a control signal is obtained having a peak magnitude in response to said first pulse and a lesser magnitude in response to said second and third pulses.

---

4,370,647

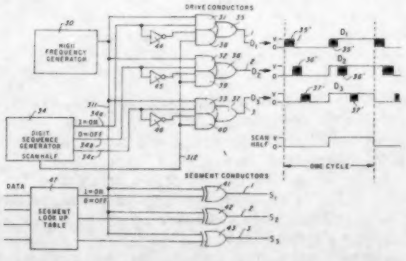
## SYSTEM AND METHOD OF DRIVING A MULTIPLEXED LIQUID CRYSTAL DISPLAY BY VARYING THE FREQUENCY OF THE DRIVE VOLTAGE SIGNAL

George L. Brantingham, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 15, 1980, Ser. No. 121,952

Int. Cl.³ G09G *3/36*

U.S. Cl. 340—784 10 Claims




1. A liquid crystal display system comprising:

(a) a liquid crystal display responsive to the application of an

electric field, said display including a plurality of segment electrodes formed on one substrate thereof and a plurality backplane electrodes formed on the opposite substrate thereof, each segment electrode cooperating with a corresponding backplane electrode to form a display segment;

(b) M number of segment conductors each being coupled to a respective group of said segment electrodes and N number of drive conductors each being coupled to a respective group of said backplane electrodes;

(c) signal generating means for generating first and second electrical signals at first and second predetermined frequencies respectively, said second frequency being substantially higher than said first frequency;

(d) first logic means coupled to said N drive conductors for applying the second signal to said drive conductors one-at-a-time in a predetermined sequence during each display scan cycle, said first signal being applied to said drive conductors during the remainder of the cycle;

(e) second logic means coupled to said M segment conductors for applying signals thereto, said second logic means being responsive to data signals indicative of the information to be displayed, said data signals representing the ON and OFF states of each segment, each segment signal being comprised of second signal components which are out of phase with respect to the second signal component of the corresponding drive conductor for the ON segments and in phase with respect to the second signal component of the corresponding drive conductor for the OFF segments so that the resultant signal applied to the ON segments has a higher frequency than that of resultant signal applied to the OFF segments.

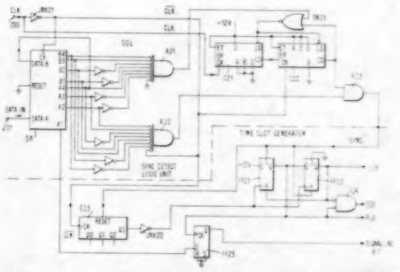
---

**4,370,648**

## SYNCHRONIZING CIRCUIT FOR USE WITH A TELECOMMUNICATION SYSTEM

**Theodore Wagner, West Palm Beach; Ramesh M. Vyas, Boca Raton, and Samuel Liang, Deerfield Beach, all of Fla., assignors to Siemens Corporation, Iselin, N.J.**

**Filed Mar. 31, 1981, Ser. No. 249,399**
**Int. Cl.³ H04J *3/06*; H04Q *11/04***
**U.S. Cl. 340—825.2** **9 Claims**



**1.** A synchronizing circuit for use with a digital communication system, said system including a transmission line arranged between a transmitting and a receiving terminal for transmitting a serial data stream at a fixed data rate under control of a system clock pulse train received by a system clock pulse line and arranged in frames each composed of a first data word containing a binary synchronization code for recovering a frame in the continuous serial data stream and a signalling code for enabling control operations of said communication system and at least a second data word containing binary coded information, said synchronizing circuit adapted to be connected to said receiving end of said transmission line for recovering the alignment of consecutive frames in the serial data stream and comprising, in combination:

(a) a serial/parallel converter being designed for a capacity of one data word of said frame and having a serial data input coupled to said transmission line, a clock input connected to said system clock pulse line, and a plurality of parallel data outputs;

(b) a synchronizing detector logic network having parallel inputs each connected to a respective one of said parallel data outputs of said serial/parallel converter and having a first and a second output, said synchronizing detector logic network generating a first and a second control signal at the respective one of said first and second outputs, wherein a respective one of said control signals occurs whenever a condition at said parallel data outputs of said serial/parallel converter reflects a synchronization code in form of a normal synchronizing bit pattern and an inverted synchronizing bit pattern, respectively;

(c) means for delaying said first control signal for a time period equivalent to the time required for receiving one frame and having an input and an output, said input of said delay means being connected to said first output of said synchronizing detector logic network;

(d) an AND-gate having a first and a second input and an output generating in synchronized operation a synchronizing signal once every alternate frame, said first input of said AND-gate being connected to said output of said delay means and said second input of said AND-gate being connected to said second output of said synchronizing detector logic network; and

(e) a time slot generator having a clock input for receiving said system clock pulse trains, a synchronizing signal input connected to the output of said AND-gate and a first and a second generator output each carrying a respective one of a first and a second enabling signal, said time slot generator including means for counting subsequent clock pulses under control of said synchronizing signal such that during receiving the first data word said first generator output and during the receiving the second data word said second generator output subsequently are carrying a respective one of said enabling signals.

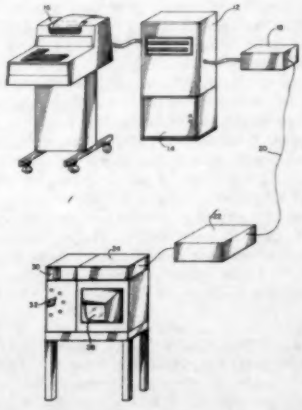
---

**4,370,649**

## PAYMENT RESPONSIVE DATA DISPLAY NETWORK

**Gerard A. Fuerle, 4434 N. Third St., Philadelphia, Pa. 19140**

**Filed May 19, 1981, Ser. No. 265,063**
**Int. Cl.³ H04Q *9/00***
**U.S. Cl. 340—825.35** **9 Claims**



**1.** A payment responsive system for displaying information, comprising:

at least one remote terminal for displaying information for a

preset time upon payment, said remote terminal having sufficient storage for all selectable information; and,

a central processor adapted to control input of information and transmission to the remote terminal, said transmission to be initiated at programmed times by the central processor independently of any occurrence of a display query at the remote terminal.

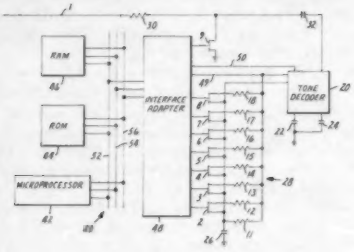
---

**4,370,650**

## TONE DETECTION CIRCUITRY

**Donald L. Norrell, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Apr. 1, 1981, Ser. No. 249,882**
**Int. Cl.³ H04Q** *9/00, 11/02;* **G01R** *23/02*
**U.S. Cl. 340—825.71** **6 Claims**




1. Tone detection circuitry for determining the receipt of a tone signal having a frequency within a selected one of a plurality of bandwidths including:

timing resistance;

timing capacitance;

a tone decoder operatively connected to said timing resistance and said timing capacitance, said tone decoder providing a signal output at a free running frequency that is inversely proportional to the product of said timing capacitance and timing resistance and providing a signal output at the frequency of an input tone signal to said decoder when such input tone signal is within the response bandwidth of the decoder; and

control means operatively connected to said tone decoder, said timing resistance and said timing capacitance, said control means providing a calibration routine which is operable subsequent to each energization of the control means for determining the product of said timing resistance and said timing capacitance for each of the plurality of bandwidths for establishing the free running frequency of said decoder as close as possible to the center frequency of each of the plurality of bandwidths, providing a retrievable record based on the product of the timing resistance and timing capacitance determined for establishing the free running frequency of said tone decoder for each of the plurality of bandwidths and providing for the selective retrieval of said retrievable record for any one of the plurality of bandwidths and establishing the product of said timing resistance and said timing capacitance in accordance with the retrieved record.

---

**4,370,651**

## ADVANCED PLASMA PANEL TECHNOLOGY

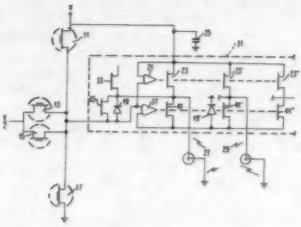
**George A. Reible, Jr., Saugerties, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 29, 1981, Ser. No. 278,270**
**Int. Cl.³ H04Q** *9/00;* **H05B** *37/00, 41/14*
**U.S. Cl. 340—825.86** **10 Claims**

1. A composite drive system for a plasma display device having a plurality of cells defined by the intersection of orthogonal conductor arrays, the discharge of selected cells providing a visual display, comprising in combination,

analog circuit means for generating a background sustain signal,

said analog circuit means comprising a plurality of high voltage circuit means for generating a signal having positive and negative excusions from a reference level,



a plurality of individual line driver circuits for applying said background sustain signal to the individual lines of said panel, and

means for controlling the operation of said line driver circuits during discharge of said selected cells to compensate for the degradation of said background sustain signal due to said discharge.

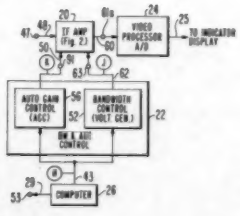
---

**4,370,652**

## CONTROL SYSTEMS FOR RADAR RECEIVERS

**George A. Lucchi, Granada Hills, Calif., assignor to Sperry Corporation, New York, N.Y.**

**Filed Jul. 2, 1980, Ser. No. 165,937**
**Int. Cl.³ G01S** *7/34*
**U.S. Cl. 343—5 SM** **10 Claims**




1. In a return echo ranging system, comprising:

means for transmitting a ranging signal;

a receiver for receiving one or more echo signals from said ranging signal;

means for sampling said echo signals according to a respective one of a plurality of predetermined receiver bandwidths, each one of said plurality of receiver bandwidths corresponding to a respective bandwidth portion of the frequency spectrum of an expected echo signal from subsequent ranging signals, to generate a sample signal indicative of the frequency spectrum bandwidth portion of such an expected echo signal; and

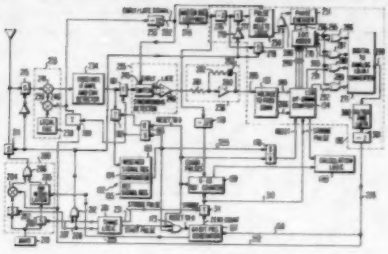
means responsive to said sample signal for varying the bandwidth of said receiver to substantially match the bandwidth of the frequency spectrum of said expected echo signal.

**4,370,653**

## PHASE COMPARATOR SYSTEM

**Albert T. Crowley, Gloucester Township, Camden County, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jul. 21, 1980, Ser. No. 170,998**
**Int. Cl.³ G01S 13/78**
**U.S. Cl. 343—6.5 LC** **8 Claims**



1. An interrogator for use in a range finding system comprising interrogator means and transponder means for generating and transmitting an interrogation signal having a first encoded portion and a first basic tone portion and a responsive signal having a second encoded portion and a second basic tone portion, in which said transponder means responds to said interrogation signal to generate and transmit said responsive signal with said second encoded and basic tone portions thereof being phase synchronous with said first encoded and basic tone portions as received at said transponder means, and in which said interrogator means comprises:

signal generating means for generating said interrogation signal and for storing the phases of said first encoded and basic tone portions of said interrogation signal;

first means for determining the difference between the stored phase of said first encoded portion of said interrogation signal and the phase of said second encoded portion of the received responsive signal;

second means for determining the difference between the stored phase of said first basic tone of said interrogation signal and the phase of said second basic tone portion of the received responsive signal to produce a first signal whose frequency is proportional to said phase difference and a second signal indicating the leading or lagging phase relationship of said first and second basic tones;

up/down counter means constructed to count at a rate determined by the frequency of said first signal and in a direction determined by said second signal; and

said signal generating means comprising means responsive to the count in said up/down counter means to alter the stored phase of said first basic tone portion towards synchronization with the phase of said received second basic tone until phase synchronization is attained.

---

**4,370,654**

## APPARATUS FOR PRODUCING A FREQUENCY CHANGE OF A WAGE PROPAGATING SIGNAL

**Thomas E. Krutsch, 12745 Moorpark St., Studio City, Calif. 91604**

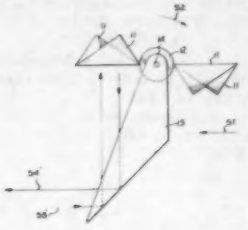
**Filed Jan. 25, 1980, Ser. No. 115,776**
**Int. Cl.³ G02B 5/122; H01Q 15/18**
**U.S. Cl. 343—18 D** **2 Claims**

1. An apparatus for producing a frequency change of wave propagating energy wherein said apparatus is mounted on a moving structure, said apparatus comprising:

a. self-directing reflecting means for reflecting the wave propagating energy which is stationary relative to said moving structure;

b. intermediate reflecting means for reflecting the incoming wave propagating energy from its source toward said self-directing reflecting means and reflecting the outgoing wave propagating energy from said self-directing reflecting means back toward its source; and

c. rotating means for rotating said intermediate reflecting means about an axis which is parallel to the direction of travel of the wave propagating energy with said self-directing reflecting means being radially disposed about



the axis of rotation of said intermediate reflecting means whereby said self-directing reflecting means is effectively moving toward or away from the wave propagating energy in relation to the structure on which said apparatus is mounted while reflecting the wave propagating energy back to the source thereof.

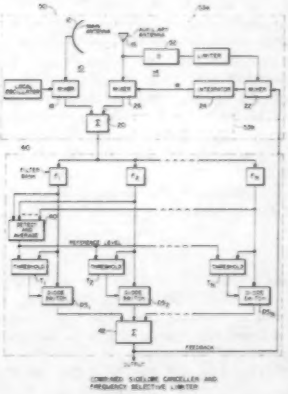
---

**4,370,655**

## COMBINED SIDE LOBE CANCELLER AND FREQUENCY SELECTIVE LIMITER

**Raymond J. Masak, East Northport, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 31, 1980, Ser. No. 221,737**
**Int. Cl.³ H04B 7/08**
**U.S. Cl. 343—100 LE** **8 Claims**



1. A side lobe interfering signal canceller system for an ECCM radar system having a main antenna and at least one auxiliary antenna comprising:

an adaptive side lobe interfering signal canceller system in circuit with said main and auxiliary antennas and including a first summing network coupled to said main and auxiliary antennas and at least one adaptive control loop;

and a frequency selective system connected in series with the output of said first summing network and including a second summing network providing a system output and a feedback signal, said feedback signal being coupled to said adaptive control loop;

said adaptive side lobe canceller being responsive to the feedback signal of said second summing network whereby a weighting signal is generated and applied to said first summing network for cancelling the side lobe interfering signals.

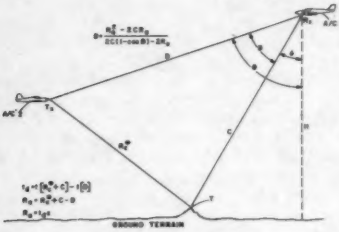
---

**4,370,656**

## USE OF BISTATIC RADAR SYSTEM FOR DETERMINING DISTANCE BETWEEN AIRBORNE AIRCRAFT

**Lawrence M. Frazier, West Covina, and Benjamin G. Lewis, Corona, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.**

**Filed Oct. 27, 1980, Ser. No. 200,660**
**Int. Cl.³ G01S *5/10***
**U.S. Cl. 343—112 D** **6 Claims**




1. A bistatic passive radar system for airborne use in a first aircraft in conjunction with a host transmitter located in a second aircraft that may be at a different altitude than the first aircraft, characterized by means for determining the distance between the aircraft comprising

means for receiving radar signals from the host transmitter directly and via reflection from a selected ground target located between the two aircraft;

means coupled to the receiving means for determining the apparent range $R_a$ from the host transmitter to the receiving means in response to receipt of said radar signals;

means for determining the altitude H of the first aircraft;

means for determining the angle $\theta$ with respect to vertical at which the radar signals are received directly from the host transmitter and for determining the angle $\phi$ with respect to vertical at which the reflected radar signals are received; and

means for computing the distance D between the aircraft from the determined values of $R_a$, H, $\theta$ and $\phi$.

---

**4,370,657**

## ELECTRICALLY END COUPLED PARASITIC MICROSTRIP ANTENNAS

**Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 9, 1981, Ser. No. 241,955**
**Int. Cl.³ H01Q *1/38***
**U.S. Cl. 343—700 MS** **11 Claims**

1. An electrically end coupled parasitic microstrip antenna for providing high gain in the end fire mode, comprising:

a. a thin ground plane conductor;

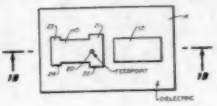
b. a driven microstrip radiating element having a feedpoint thereon;

c. said driven radiating element being fed from a microwave transmission line at said feedpoint;

d. at least one parasitic microstrip radiating element being spaced apart from one end of said driven radiating element in an end-to-end arrangement;

e. said driven microstrip radiating element and said at least one parasitic microstrip radiating element being equally spaced apart from said ground plane and separated from said ground plane by a dielectric substrate;

f. said driven microstrip radiating element being electrically coupled end-to-end to said at least one parasitic microstrip radiating element by the electric field generated in said driven element when excited to radiate by energy fed to said feedpoint; both said driven element and said at least one parasitic element being excited to radiate, the energy in the end fire direction adding between the end-to-end coupled microstrip elements to provide high gain;




g. the antenna radiation pattern being determined by the phase relationship and amplitude distribution between said excited driven element and said at least one parasitic element, the phase relationship and amplitude distribution being governed by the end-to-end separation between the driven element and said at least one parasitic element and the length of said at least one parasitic element; the mutual coupling impedance and the input impedance of the driven element which together form the antenna impedance also being governed by the end-to-end separation between the driven element and said at least one parasitic element.

---

**4,370,658**

## ANTENNA APPARATUS AND METHOD FOR MAKING SAME

**Fred G. Hill, 8591 Ideal Ave. South, Cottage Grove, Minn. 55016**

**Filed Apr. 29, 1981, Ser. No. 258,688**
**Int. Cl.³ H01Q *1/32***
**U.S. Cl. 343—713** **12 Claims**

1. A combination dual antenna and air current deflector shield for mounting as an accessory on an outside surface and transverse to a body of a motor vehicle comprising:

(a) a planar member having a first layer of a hard gel coat and second, third and fourth layers of polyester resin and fiberglass, said planar member being configured in the shape of an air current deflector shield;

(b) a generally planar first conductor member having an elongate primary member and a plurality of secondary members connected to and generally perpendicular to said primary member, said first conductor member being encapsulated between said second and said third layers;

(c) a generally planar second conductor member having an elongate primary member and a plurality of secondary members connected to and generally perpendicular to said primary member, said second conductor member being encapsulated between said third and said fourth layers;

(d) a first coupler mounted to said planar member having a

first terminal suitable for providing electrical connection to an electrical reference potential of a motor vehicle and a second terminal operatively connected to the first antenna conductor member suitable for connection to an input/output terminal of a receiver/transmitter; and

(e) a second coupler mounted to said planar member having a first terminal suitable for providing electrical connection to an electrical reference potential of a motor vehicle and a second terminal operatively connected to the first antenna conductor member suitable for connection to an input/output terminal of a receiver/transmitter, whereby when said planar member is mounted to the outside surface of a motor vehicle, said planar member is an air current deflector shield.

---

**4,370,659**

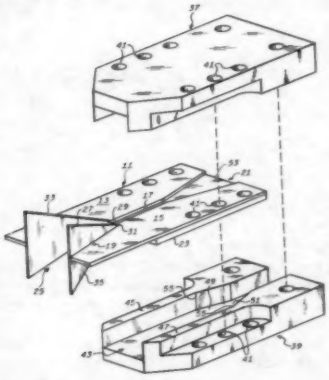
## ANTENNA

**James C. Chu; Patrick E. Crane, both of Tampa, Fla.; Jack V. D'Agostino, Florissant, Mo., and Paul M. Schwartz, Belcair Beach, Fla., assignors to Sperry Corporation, New York, N.Y.**

**Filed Jul. 20, 1981, Ser. No. 285,218**

**Int. Cl.³ H01Q *1/20***

**U.S. Cl. 343—772** **9 Claims**



1. A sectoral antenna for use with finline electromagnetic wave transmission means of the type having two thin coplanar fin elements disposed with adjacent edges forming a narrow channel transmission path having a flare from a first end at a predetermined angle, said antenna comprising first and second triangular shaped planar members, each having a vertex and a base opposite said vertex, said triangular shaped planar members disposed in planes normal to said plane of said fin elements, and supported respectively by said adjacent edges of said fin elements along said flare such that said vertex of each triangular shaped planar member is positioned adjacent said first end of said narrow channel and housing means enclosing said transmission path.

---

**4,370,660**

## BROADBAND ELLIPTIC SHEET ANTENNA

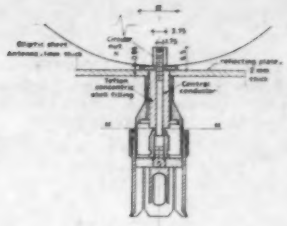
**Moustafa N. I. Fahmy, Ammariya Building, (Flat 46), Al-Batt-'ha St., Riyadh, Saudi Arabia**

**Filed May 17, 1978, Ser. No. 906,672**

**Int. Cl.³ H01Q *9/28***

**U.S. Cl. 343—795** **3 Claims**

1. A broadband monopole antenna comprising a conducting elliptical sheet having an eccentricity of 0.8, a ground plane spaced from said elliptical sheet parallel to the major axis and perpendicular to the minor axis, a 50 ohm coaxial cable feed line having an outer conductor connected to said ground plane and an inner conductor passing through a hole in said ground plane, an insulating washer surrounding said inner conductor, a circular nut welded to said elliptical sheet at said minor axis, said inner conductor being in threaded communication with



DETAILS OF THE INPUT REGION AND COAXIAL FEED OF ELLIPTIC SHEET MONOPOLE ANTENNA

said nut to feed power to said elliptical sheet and to maintain its position with respect to the ground plane.

---

**4,370,661**

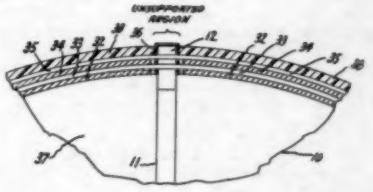
## EASILY ASSEMBLED TRANSVERSE MAGNETIC PRINTING HEAD

**Ami E. Berkowitz, Schenectady, N.Y.; Joseph A. Lahut, Waynesboro, Va., and Jish M. Wang, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 60,921, Jul. 26, 1979, abandoned. This application Oct. 2, 1980, Ser. No. 193,398**

**Int. Cl.³ G11B *9/00***

**U.S. Cl. 346—74.5** **7 Claims**




1. A transverse magnetic printing head driven in a coincident current mode in which there are (W×D) recording gaps organized into W adjacent word segments, each word segment having D independent digits, said head comprising:

a rigid supporting member having a transverse slot therein;

a comb structure of high magnetic permeability material with teeth forming (W×D) recording gaps between the tips of said teeth, said comb structure being received into the transverse slot of said supporting member in such a manner that the teeth of said comb structure protrude above said supporting member;

an insulated word line drive circuit with W independent word lines, each of said word lines forming a zig-zag pattern spaced so as to match the spacing of the teeth on the comb structure, each of said word lines repeatedly crossing said transverse slot and threading through a selected one of said recording gaps, said word line drive circuit being mounted in a flush manner against said supporting member so as to align the magnetic comb structure with said transverse slot; and

an insulated digit line drive circuit with D independent digit lines, each digit line, $d_i$, for i ranging from 1 to D, being spaced and laid out in such a manner so as to thread through the $i^{th}$ recording gap position in alternate word segments and through the $(D-i+1)^{th}$ recording gap position in the remaining word segments, each such digit line also repeatedly crossing said transverse slot, said digit line

drive circuit being mounted in a flush manner either over or under said word line drive circuit so as to align the magnetic comb structure with the transverse unsupported gap region.

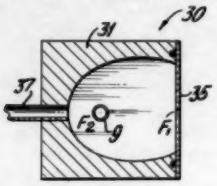
---

4,370,662

## INK JET ARRAY ULTRASONIC SIMULATION

Shou L. Hou, Radnor, Pa., and Isao Tashiro, Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 2, 1980, Ser. No. 212,250
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 23 Claims




1. An ink jet array apparatus for the generation of a plurality of continuous streams of ink drops comprising:
an elongated ink chamber having means connecting the chamber to a source of ink under pressure;
an ink jet orifice plate connected to said chamber as one of the walls of the chamber and having a plurality of orifices to form an array of ink jet filaments; and
an elongated electro-acoustic transducer means within said chamber to convert electrical energy into perturbations of the ink;
wherein the inner walls of the chamber, in cross-section, are sectors of an ellipse, the transducer means is positioned at one focus of said ellipse and the orifices are positioned at the other focus of the said ellipse.

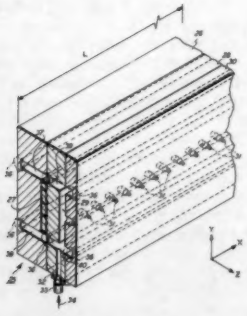
---

4,370,663

## THIN BODY INK DROP GENERATOR

Roger G. Markham, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1980, Ser. No. 212,646
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 12 Claims



5. A liquid drop generator comprising a wide thin flexible piezoelectric exciter, backing, transmission and nozzle plates arranged to support said piezoelectric exciter between the backing and transmission plates and to define a wide, thin liquid chamber between the transmission and nozzle plates, said exciter and chamber bounded by a top and bottom moat chamber formed by said backing, transmission and nozzle plates to confine acoustic energy generated by the exciter to certain regions of the backing, transmission and nozzle plates,
a plurality of nozzles formed in the nozzle plate and arranged along the thin lateral dimension of the chamber for emitting liquid columns under pressure from which drop streams are formed in flight toward a target,
the width of the chamber and arrangement of the nozzles being a distance that is a significant portion of the width or length of a target.

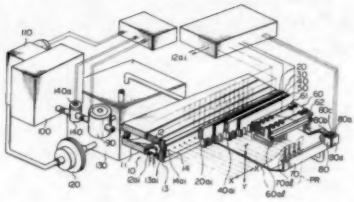
---

4,370,664

## INK JET PRINTING APPARATUS

Masanori Horike; Yutaka Yoshiba, and Yutaka Ebi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,464
Claims priority, application Japan, Apr. 14, 1980, 55-48882; Apr. 17, 1980, 55-50907; Apr. 18, 1980, 55-51398
Int. Cl.³ G01D *18/00*
U.S. Cl. 346—75 5 Claims



1. An ink jet printing apparatus comprising:
an ink ejection head having a plurality of nozzles each for ejecting a jet of ink;
charging means for electrostatically charging the ink jet;
deflection position control means adapted to repeat detection and adjustment of a deflection position a plurality of times; and
control means for controlling at least one of the charging means and deflecting means to adjust a voltage level which determines an amount of the deflection of the ink jet;
the voltage level which determines an amount of deflection being variable;
the amount of variation of the voltage level decreasing progressively as the deflection adjustment is repeated.

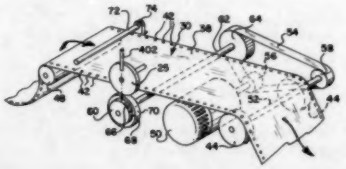
---

4,370,665

## PAPER TRANSPORT FOR A PRINTER TEST UNIT

Robert J. Scranton, Dayton, and James R. Meckstroth, Centerville, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 27, 1981, Ser. No. 257,677
Int. Cl.³ G01D *18/00*
U.S. Cl. 346—75 19 Claims



1. A paper transport for use with a printer system of the type arranged to print documents as said documents are succes-

sively transported past a print station, said system including a photo-optical document detector for detecting movement of successive documents past said print station by directing a beam of light across the path of said documents at said print station and detecting changes in the amount of light reflected to said photo-optical document detector, comprising:

means for transporting a paper web past said print station for printing on said web, and

document simulator means, positioned at said print station, for cyclically altering the amount of light reflected to said photo-optical document detector, whereby movement of documents past said print station is simulated and printing may be effected on said paper web in response to changes in the amount of light reflected from said document simulator means.

---

**4,370,666**

## THERMAL HEAD DRIVING DEVICE

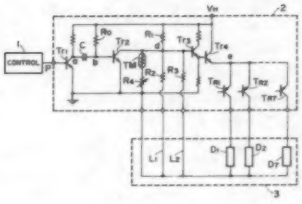
**Atsushi Noda, and Takayoshi Hanagata, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 31, 1980, Ser. No. 173,888**

**Claims priority, application Japan, Aug. 10, 1979, 54/102626**

**Int. Cl.³ G01D** *15/10*

**U.S. Cl. 346—76 PH** **15 Claims**




1. A driving device connected to a source of printing pulses for driving a thermal head that includes a plurality of heating resistors, said driving device comprising:

a driving circuit for applying a current to drive said thermal head in response to printing pulses;

a safety circuit connected to said source and to said driving circuit for limiting the duration of the printing pulses applied to drive said thermal head to a predetermined duration; and

a temperature correcting circuit connected to said safety circuit for varying the voltage of printing pulses applied by said safety circuit to said driving circuit in accordance with the ambient temperature and for maintaining constant the current applied to said thermal head by said driving circuit in response to the printing pulses, while controlling the bias to said driving circuit.

---

**4,370,667**

## LASER RECORDER

**Yuji Ohara, and Masahiro Ohnishi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

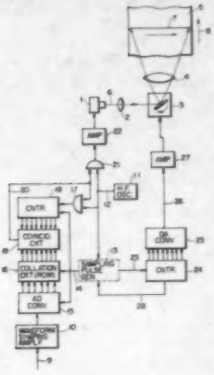
**Filed Feb. 4, 1981, Ser. No. 231,561**

**Claims priority, application Japan, Feb. 8, 1980, 55/14627**

**Int. Cl.³ G01D** *15/14*

**U.S. Cl. 346—108** **6 Claims**

1. A laser recorder device comprising: means for scanning a recording medium with a plurality of parallel scanning lines; means for generating a recording beam in response to input pulses, said beam being scanned by said scanning means onto said recording medium; means for generating high frequency pulses for application to said beam generating means; means for generating sampling pulses for sampling an input signal, the frequency of said high frequency pulse signal being at least two orders of magnitude greater than the frequency of said sampling pulse signal, the phase of said sampling pulse signal being different for adjacent scanning lines; and means for applying a number of said pulses of said high frequency pulse signal to




said beam generating means in response to a predetermined function of said sampled input signal.

---

**4,370,668**

## LIQUID EJECTING RECORDING PROCESS

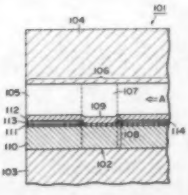
**Toshitami Hara, Tokyo, and Shigeyuki Matsumoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 18, 1980, Ser. No. 208,040**

**Claims priority, application Japan, Dec. 28, 1979, 54-171336**

**Int. Cl.³ G01D** *15/18*

**U.S. Cl. 346—140 R** **5 Claims**

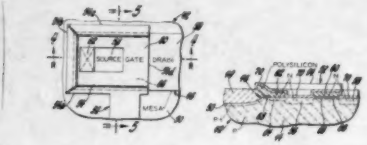



1. A liquid ejecting recording process using a liquid ejecting recording head comprising: a liquid discharging portion including an orifice for ejecting liquid droplets, a heat acting portion in communication with the orifice, said heat acting portion being a portion where heat energy for discharging liquid droplets acts on a liquid, and an electrothermal transducer having a laminated structure provided on a substrate, with the structure comprising a lower layer positioned on the substrate, a resistive heater layer having electrodes A and B electrically connected thereto, and an upper layer positioned uppermost from the substrate and having a heating surface a portion of which is positioned in the heat acting portion, so that when a potential V is applied to the heating surface and potentials $V_A$ and $V_B$ are generated at the electrodes A and B, respectively, of said resistive heater layer, the potential V applied to the heating surface is kept at a potential intermediate the potentials $V_A$ and $V_B$.

## 4,370,669
## REDUCED SOURCE CAPACITANCE RING-SHAPED IGFET LOAD TRANSISTOR IN MESA-TYPE INTEGRATED CIRCUIT

William B. Donley, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1980, Ser. No. 169,527
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 3 Claims

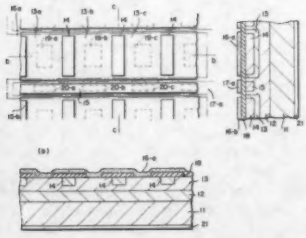


1. In a self-aligned polysilicon gate depletion-type n-channel IGFET having an electrically shorted source region and gate, a drain region coupled with a source of constant potential, having said source region coupled with a source of time varying potential, and formed on a P type silicon mesa that is surrounded by P+ type silicon under a thick silicon dioxide field layer, the improvement comprising means for reducing transistor source capacitance in response to said time varying potential coupled with said source region, the improvement including the polysilicon gate being a ring, the ring wholly encloses a portion of the mesa spaced inwardly from said P+ type silicon, and the enclosed mesa portion serves as the IGFET source region, and no portion of the IGFET source region intersects the P+ type silicon and IGFET capacitance attributable thereto upon variations in source potential is eliminated.

## 4,370,670
## TRANSISTOR WITH PLURAL PARALLEL UNITS

Yoshiaki Nawata; Yasutaka Nakatani, both of Yakohama, and Haruki Nakazawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 7, 1980, Ser. No. 138,111
Claims priority, application Japan, Apr. 11, 1979, 54-43967
Int. Cl.³ H01L 29/72
U.S. Cl. 357—36 24 Claims

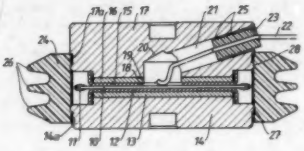


1. A transistor comprising,
a collector region having a first conductivity type,
a base region having the opposite conductivity type disposed in contact with said collector region,
at least one emitter region having said first conductivity type formed in said base region,
a plurality of isolation regions having said opposite conductivity type selectively formed in each said emitter region to divide each said emitter region into a respective plurality of smaller emitter regions, each said smaller emitter region forming a p-n junction with said base region over essentially the entire area of the smaller emitter region, and
a stabilizing resistor corresponding to at least one of each said smaller emitter regions and located in the vicinity thereof, each said stabilizing resistor having a first terminal connected to the respective smaller emitter region(s) at a position over and within said area of said p-n junction.

## 4,370,671
## SEMICONDUCTOR DEVICE

Gunno Eriksson, Hallstahammar, and Anders Nilarp, Vasteras, both of Sweden, assignors to Asea Aktiebolag, Vasteras, Sweden

Filed Feb. 13, 1980, Ser. No. 121,155
Claims priority, application Sweden, Feb. 21, 1979, 7901535
Int. Cl.³ H01L 23/42
U.S. Cl. 357—79 6 Claims



1. A semiconductor device comprising a semiconductor wafer arranged between two metallic connecting members for supplying electric current to and leading it from said semiconductor wafer, each of said connecting members having a substantially cylindrical external part with at least one of the substantially cylindrical parts including an aperture, a control electrode extending through said aperture and contacting said semiconductor wafer, and a ring made from a material selected from the group consisting of a sulphone polymer and polyphenylene sulphide and having peripheral ridge portions on the internal surface thereof surrounding and in engagement with respective ones of said substantially cylindrical parts with a surface pressure of at least 10 N/mm², each of said peripheral portions, prior to engagement of the ring with said substantially cylindrical parts, having a diameter larger than the diameter of the cylindrical part with which it is substantially engaged, a plug of the same material as said ring and including ridges engaging the internal surface of said aperture with a pressure of at least 10 N/mm², whereby said connecting members and said ring form a protective casing around the semiconductor wafer.

## 4,370,672
## COLOR SUBCARRIER REGENERATOR FOR SLOW DOWN PROCESSOR

Michael D. Ross, Somerdale, and Jon K. Clemens, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

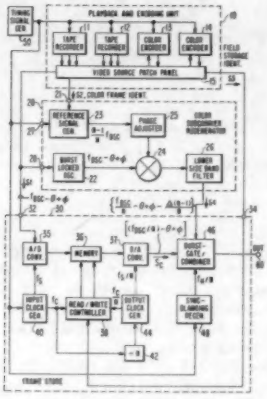
Filed Sep. 24, 1980, Ser. No. 190,277
Int. Cl.³ H04N 5/76, 9/46
U.S. Cl. 358—312 6 Claims

1. A color subcarrier regenerator for use in a video signal frame store of the type in which luminance and chrominance components of a composite video input signal are stored at one rate and recovered from the frame store at a lesser rate 1/N, N being an integer greater than unity, said regenerator comprising:
first means responsive to the color burst component of said input video signal for producing a first conversion signal having a frequency equal to that of said color burst component;
second means responsive to a fixed reference frequency signal for producing a second conversion signal having a

frequency less than that of said first conversion signal by a factor $(N-1)/N$;

third means for multiplying said conversion signals to form a product signal having sum and difference components;

fourth means for applying said difference component of said product signal as a color subcarrier reference signal to a combining means in said frame store for forming a composite video output signal having a regenerated burst component; and



fifth means for effectively adjusting the phase of said difference component of said product signal to a value such that said regenerated burst component exhibits a phase relative to the chrominance component of said video output signal substantially equal to the phase relationship between the chrominance and burst components of said composite video input signal.

---

**4,370,673**

## SIGNAL GENERATOR FOR A COLOR TELEVISION TRANSMITTING SYSTEM

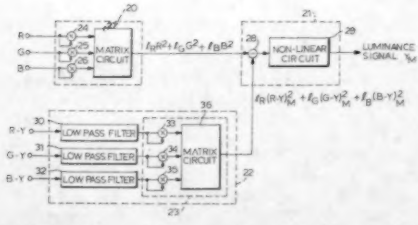
**Tetsuo Tomimoto, Osaka; Yoshitomi Nagaoka, Neyagawa; Reiichi Sasaki, Yawata, and Hiroshi Oyama, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 18, 1980, Ser. No. 218,012**

**Claims priority, application Japan, Dec. 20, 1979, 54-166507**

**Int. Cl.³ H04N 9/535**

**U.S. Cl. 358—21 R** **7 Claims**



1. A signal generator for a color television transmitting system which has a narrower bandwidth color-difference signal channel than a luminance signal channel, said signal generator comprising:

a primary color level detector, which is supplied with primary color signals representative of red, green and blue levels of a picture, for substantially respectively squaring said primary color signals, and for adding said squared signals together, and for outputting a primary color level signal representative of a luminance of a picture;

a color-difference level detector, which is supplied with wideband color-difference signals representative of red, green and blue chrominance levels of a picture, for extracting low frequency components of said color-difference signals, and for respectively squaring said low frequency components, and for adding said squared low frequency components together, and for outputting a color-difference level signal representative of a luminance component conveyed by said color-difference signal;

a luminance signal producer, which is supplied with said primary color level signal and said color-difference level signal, for outputting a luminance signal in response to the difference between said primary color level signal and said color-difference level signal.

---

**4,370,674**

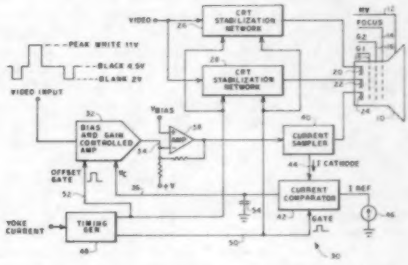
## STABILIZATION NETWORK FOR A CATHODE RAY TUBE

**Fred D. Johnson, Evanston; Michael D. Flasza, and Wayne E. Bretl, both of Schaumburg, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.**

**Filed Mar. 3, 1981, Ser. No. 239,969**

**Int. Cl.³ H04N 9/16**

**U.S. Cl. 358—74** **12 Claims**



1. In a color television receiver which develops a video drive signal and which includes a cathode ray tube having at least one cathode, a stabilization network which compensates for variable emission characteristics of the cathode, comprising:

a variable gain amplifier receiving the video drive signal for driving the cathode with an amplified video signal and a D.C. bias, said amplifier being responsive to a variable control voltage for altering its gain and its D.C. bias output such that, for a given cathode current which is developed in response to the D.C. bias, a selected peak white cathode current is developed in response to peak white portions of the video signal;

means for generating a fixed reference current indicative of a desired black level cathode current;

a comparator receiving the cathode current and the reference current and responsive to an enabling signal for comparing the cathode current to the reference current and for generating a control signal indicative of the difference between the cathode current and the reference current;

means for coupling the control signal to the amplifier; and

a timing generator for applying an enabling signal to the comparator and for simultaneously driving the video drive signal to black level during the receiver's vertical interval so that the control signal simultaneously alters both the gain and the D.C. bias output of the amplifier such that the cathode current is set to the reference black level current, and video drive signals received subsequent

to the vertical interval are amplified so that their peak white portions develop given peak white cathode currents.

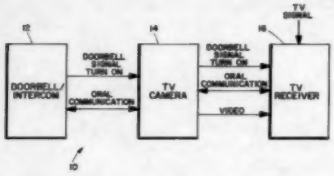
---

**4,370,675**

## DOORBELL ACTUATED TELEVISION SECURITY SYSTEM

**William E. Cohn, Skokie, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**

**Filed Jan. 5, 1981, Ser. No. 222,816**
**Int. Cl.³ H04N *7/18***
**U.S. Cl. 358—108** **7 Claims**




1. A doorbell actuated video and audio security system comprising:

a video camera;

a television receiver including a power switch, video and audio signal processing circuitry, a video display and audio speaker/microphone combination, said television receiver coupled to said video camera for receiving and displaying video information therefrom;

an intercom system coupling a speaker/microphone combination located in the general vicinity of said video camera to the audio speaker/microphone in said television receiver;

first bistable switching means coupled to said doorbell for turning on said television receiver and providing camera video information and intercom audio signals thereto if said power switch is OFF; and

second switching means coupled to said doorbell and responsive to the actuation thereof for switching the input to said television receiver video and audio signal processing circuitry from received television signals to said camera video information and intercom audio signals, respectively, if said power switch is ON when said doorbell is actuated.

---

**4,370,676**

## CARRIER REGENERATING CIRCUIT FOR A SYNCHRONOUS DETECTOR

**Masayuki Hongu, Kawasaki; Shigeru Omuro, Higashimine; Hiroyuki Kita, Yokosuka, and Masaharu Tokuhara, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jun. 26, 1981, Ser. No. 277,739**
**Claims priority, application Japan, Jul. 3, 1980, 55-90990**
**Int. Cl.³ H04N *5/44*; H03D *3/18***
**U.S. Cl. 358—188** **7 Claims**

1. A synchronous detector for detecting an information signal modulated onto a carrier, comprising:

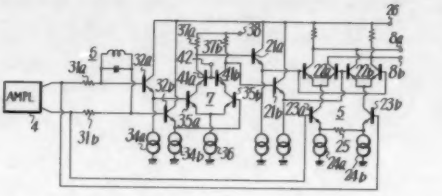
means for receiving said modulated information signal;

filter means coupled to said receiving means, said filter means including a tuning circuit tuned to the frequency of said carrier;

emitter follower means connected to the output of said filter means;

limiter means including a differential amplifier having first and second transistors, base electrodes of which are connected to the output of said emitter follower means, and third and fourth transistors, base electrodes of which are connected together, and emitter electrodes of which are respectively connected to collector electrodes of said first and second transistors, collector electrodes of said third and fourth transistors being output terminal means for providing a switching carrier; and

multiplier means having first and second input terminals




respectively coupled to said output terminal means of said limiter means and to said receiving means, for multiplying said modulated information signal and said switching carrier to obtain said information signal.

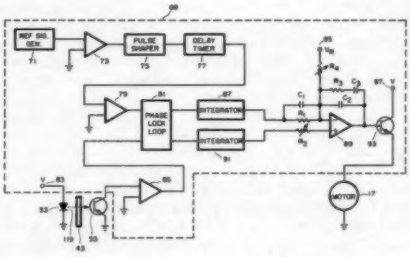
---

**4,370,677**

## ROTATING SHUTTER SYSTEM FOR IMPROVING THE RESOLUTION OF A VISUAL DISPLAY SYSTEM

**Dorothy M. Baldwin, Lake Monroe; Frank J. Oharek, Orlando, both of Fla., and Curt Stahl, Scarsdale, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Dec. 11, 1980, Ser. No. 215,213**
**Int. Cl.³ H04N *5/30, 5/72***
**U.S. Cl. 358—225** **13 Claims**




1. A rotating shutter system for improving the resolution of an annular probe based 360° visual display system, comprising in combination:

a rotating shutter having on one surface thereof a plurality of evenly spaced opaque radial lines;

servo motor means effectively connected to said rotating shutter for rotating said shutter at a predetermined speed;

transmitting means positioned above said rotating shutter, and having an input for broadcasting through said rotating shutter a light beam such that said light beam will be broken by the opaque radial lines of said rotating shutter at a frequency corresponding to the speed of rotation of said rotating shutter;

sensing means positioned below said rotating shutter in alignment with said transmitting means and having an output for receiving said broken light beam, and for providing at the output thereof a shutter error signal in response to the broken light beam received thereby, said shutter error signal having a frequency corresponding to the frequency at which said light beam is broken by said rotating shutter; and

feedback circuit means comprising:

a reference signal generator having an output;

a pulse shaper having an input effectively connected to the output of said reference signal generator, and an output;

a delay timer having an input connected to the output of said pulse shaper, and an output;

a phase lock loop having a reference input effectively connected to the output of said delay timer, a signal input effectively connected to the output of said sensing means, a slow error signal output, and a fast error signal output;

a first integrator having an input connected to the slow signal error output of said phase lock loop, and an output;

a second integrator having an input connected to the fast signal error output of said phase lock loop, and an output;

a differential amplifier having a negative input connected to the output of said first integrator, a positive input connected to the output of said second integrator, and an output;

a direct current voltage source having an output; and

a transistor having a collector connected to the output of said direct current voltage source, a base connected to the output of said differential amplifier, and an emitter connected to the input of said servo motor means.

---

**4,370,678**

## RECORDING APPARATUS WITH BEAM SCAN INFORMATION READING

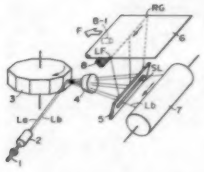
**Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 12, 1980, Ser. No. 215,828**

**Claims priority, application Japan, Dec. 21, 1979, 54-166571; Jan. 24, 1980, 55-7223**

**Int. Cl.³ H04N *1/24***

**U.S. Cl. 358—285** **8 Claims**




1. A recording apparatus with beam scan information reading, comprising:

a semiconductor array laser capable of generating plural laser beams from respective laser elements;

a collimating optical system in which said plural of laser beams from said semiconductor array laser are so commonly collimated as to have different emerging directions;

deflecting means for deflecting the beams emerging from said optical system;

irradiating means for irradiating a recording member with a portion of said deflected beams and irradiating a document with another portion of said deflected beams;

converting means for converting the reflected or transmitted light obtained from said other portion of said deflected beams directed to the document into electric signals; and

drive means for driving said laser elements for generating beams for irradiating said recording member according to said electric signals obtained by said converting means.

**4,370,679**

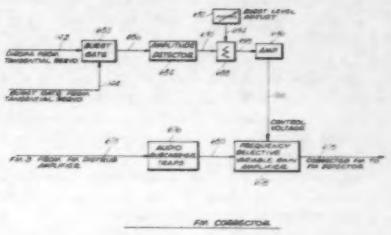
## GAIN CORRECTION SYSTEM FOR VIDEODISC PLAYER APPARATUS

**Ludwig Ceshkovsky, Fountain Valley, and Wayne R. Dakin, Redondo Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.**

**Division of Ser. No. 890,670, Mar. 27, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 130,902**

**Int. Cl.³ H04N *5/76, 9/535***

**U.S. Cl. 358—318** **4 Claims**




1. Apparatus for use in a signal recovery system for recovering a video signal from a video disc, wherein the signal includes luminance information, chrominance information and periodic chrominance bursts having a prescribed amplitude, wherein the signal is recorded in a succession of light reflective and light non-reflective regions forming a plurality of substantially circular and concentrically arranged information tracks, and wherein the system includes means for focusing a beam of radiation onto a selected track as the disc is rotated at a prescribed angular velocity and means for detecting a reflected beam of radiation having an intensity modulated by the recorded video signal, the gain of the higher frequency portion of the spectral response of the signal recovery system decreasing as the radius of the selected track decreases, thereby causing a corresponding variation in the respective amplitudes of the chrominance and luminance portions of the recovered video signal, said apparatus operating to correct for the variable gain of the system by controllably amplifying the corresponding portion of the frequency spectrum of the recovered video signal, said apparatus comprising:

means for detecting the amplitude of the successive chrominance bursts in the recovered video signal and for producing a corresponding control signal; and

means for amplifying the video signal recovered from the disc, said control signal being coupled to said amplifying means to controllably adjust its gain for a frequency band corresponding to the higher frequency portion of the recovered video signal, thereby correcting for the variable gain of the signal recovery system.

---

**4,370,680**

## COLOR SIGNAL PROCESSING DEVICE FOR VIDEO RECORDER

**Shinichiro Taguchi; Nobuya Nagao, and Yutaka Ogihara, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Feb. 25, 1981, Ser. No. 238,022**

**Int. Cl.³ H04N *9/491***

**U.S. Cl. 358—330** **5 Claims**

1. A color signal processing device characterized by comprising:

a color signal amplifying circuit to which is selectively input through a first switching circuit an original color signal or a regenerative low frequency converted color signal according to the recording/reproducing mode of a video tape recorder, and which is gain-controlled by gain control means;

a first balanced modulator to which is input an output of said

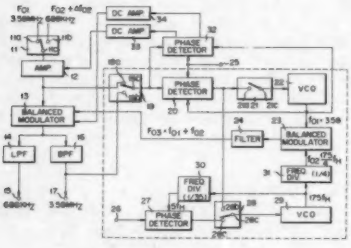
color signal amplifying circuit as well as a converting signal to provide a balanced modulated output of both input signals, and which has a control terminal for enabling control by color killer means;

a low-pass filter and a band-pass filter to which is input an output of said first balanced modulator;

a second switching circuit, to a first input terminal of which is input an output of said color signal amplifying circuit, and to a second input terminal of which is input an output of said band-pass filter, for selectively obtaining the signal at said first input terminal or said second input terminal according to the recording/reproducing mode of the video tape recorder;

a first phase detector, to one input terminal of which is input an output of said second switching circuit, and to the other input terminal of which is input an oscillation output of a first voltage controlled oscillator, for detecting a phase difference between the two input signals in a gate pulse period of a burst signal;

a third switching circuit, to which is input a phase detection output of said first phase detector, and which inputs or does not input this to an oscillation output control terminal of said first voltage controlled oscillator according to the recording/reproducing mode of the video tape recorder;




a second balanced modulator, to one input terminal of which is input an oscillation output of said first voltage controlled oscillator, and to the other input terminal of which is input a divided output of a first divider for dividing the oscillation output of a second voltage controlled oscillator, for applying a balanced modulated output of the two input signals to a converting signal input terminal of said first balanced modulator through a filter;

a second phase detector, to one input terminal of which is input a divided output of a second divider for dividing an oscillation output of said second voltage controlled oscillator, and to the other input terminal of which is input a horizontal sync signal, for obtaining a phase-detection output representing a frequency synchronization error of the two input signals; and

a fourth switching circuit, to a first input terminal of which is input a phase detection output of said second phase detector, and to a second input terminal of which is input a phase detection output of said first phase detector, for selectively inputting signals of said first and second input terminals to an oscillation output control terminal of said second voltage controlled oscillator according to the recording/reproducing mode of the video tape recorder.

**4,370,681**

## GAIN CONTROL CIRCUIT FOR NOISE REDUCTION SYSTEM

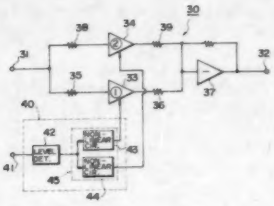
**Kenzo Akagiri, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed May 19, 1980, Ser. No. 151,363**

**Claims priority, application Japan, May 29, 1979, 54-65563**

**Int. Cl.**[3] **G11B** *5/02, 5/45, 15/02*

**U.S. Cl. 360—68** **18 Claims**




1. In apparatus for recording an information signal on a recording medium by a recording device, gain control means comprising:

means defining a first transmission path for compressing said information signal supplied thereto with a first gain characteristic;

means defining a second transmission path separate from said first transmission path for compressing the same information signal supplied to said first transmission path with a second gain characteristic different from said first gain characteristic; and

means for providing a substantially constant overall compression characteristic for said apparatus by effectively supplying the information signal to said recording device by way of said first transmission path when the amplitude of the information signal is below a predetermined value and for effectively supplying said information signal to said recording device by way of said second transmission path when the amplitude of said information signal is above said predetermined value, said means for providing including amplifier means having an input supplied with the compressed information signal from said first transmission path and with the compressed information signal from said second transmission path whereby said compressed information signal from said first transmission path and said compressed information signal from said second transmission path are added at the input of said amplifier means.

---

**4,370,682**

## TAPE LOADING APPARATUS IN A RECORDING AND/OR REPRODUCING APPARATUS

**Hiroshi Katoh, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Jan. 4, 1980, Ser. No. 109,672**

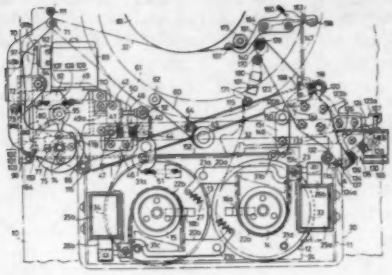
**Claims priority, application Japan, Jan. 12, 1979, 54-2683; Jan. 12, 1979, 54-2684; Jan. 12, 1979, 54-2685**

**Int. Cl.**[3] **G11B** *15/66, 15/18, 5/52*

**U.S. Cl. 360—71** **4 Claims**

1. A video cassette tape player comprising means for supporting a tape supply reel and a tape takeup reel with a length of tape extending between said reels; separate motor means individually associated with each of said reels for selectively transporting said tape back and forth between said reels; means for pulling said length of tape from said reels and into a predetermined tape path; means for normally holding said reels immobile against random rotation; means responsive to a playback command signal for releasing said holding means, starting said pulling means, and energizing said motor means; means for feeding back a control signal for applying a minimum driving

power to each of said motor means in order to maintain a predetermined and balanced tension in said length of said tape while it is being pulled into said predetermined tape path; and



means responsive to said tape reaching said predetermined tape path for reapplying said holding means, stopping said pulling means, and controlling the power applied to each of said motor means.

---

**4,370,683**

## CROSS-COUPLED SERVO CONTROL MECHANISM FOR REEL-TO-REEL TAPE DRIVES

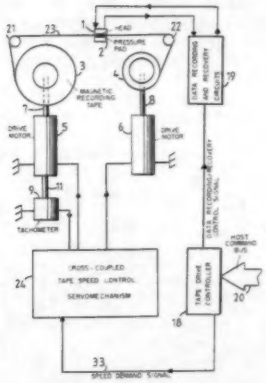
**George H. Greig, and Archibald M. Pettigrew, both of Kirkcaldy, England, assignors to Burroughs Corporation, Detroit, Mich.**

**Filed Nov. 5, 1979, Ser. No. 91,441**

**Claims priority, application United Kingdom, Nov. 28, 1978, 46353/78**

**Int. Cl.³ G11B** *15/46, 19/20*

**U.S. Cl. 360—73** **10 Claims**



1. A tape drive system for driving first and second tape storage reels containing a tape, comprising:

first and second tape moving means mechanically coupled, respectively to said first and second tape storage reels;

a tape drive controller for providing an analog signal indicative by magnitude of the required rotational speed of said first tape storage reel and by polarity of the direction of travel of said tape;

a tape speed control servo including:

a speed transducer mechanically coupled to said first tape moving means for producing a signal indicating the speed and direction of said first tape moving means;

first and second signal compensating networks each receiving the output of said speed transducer, the first signal compensating network delivers at its output a greater portion of its input signal than does the second signal compensating network;

a first signal summing junction for receiving and summing the output of said first signal compensating network and the output of said tape drive controller;

a second signal summing junction for receiving and summing the output of said second signal compensating network and the output of said tape drive controller;

a signal inverter for receiving and inverting the output of said second summing junction;

a first signal amplifier means receiving the output of said first summing junction for providing a unidirectional control signal to said first tape moving means; and

a second signal amplifier means receiving the output of said signal inverter for providing a unidirectional control signal to second tape moving means.

---

**4,370,684**

## TAPE RECORDER WITH AUTOMATIC TAPE END STOPPING AND ALARM GENERATION

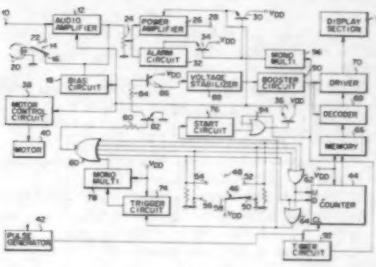
**Katsumi Kanayama; Kazuyasu Motoyama, and Kenzi Furuta, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed May 9, 1980, Ser. No. 148,503**

**Claims priority, application Japan, May 15, 1979, 54-64439[U]**

**Int. Cl.³ G11B** *19/06, 15/48*

**U.S. Cl. 360—74.2** **2 Claims**



1. A tape recorder in which an audio signal is supplied to a magnetic head through an audio amplifier with an output signal from a bias circuit at the time of a recording operation, and an output signal from the magnetic head is supplied to a loudspeaker through the audio amplifier and a power amplifier at the time of a reproducing operation, comprising:

means for running a magnetic tape;

pulse generating means for generating a pulse signal representing a distance for which the tape travels, said pulse signal comprising spaced apart pulses;

counting means coupled to said pulse generating means for counting pulses of the pulse signal from said pulse signal generating means;

detecting means coupled to said pulse generating means for producing a detection signal, the level of which changes when the pulse interval between pulses of said pulse signal exceeds a predetermined interval;

alarm means for producing an alarm through the power amplifier to the loudspeaker;

first power supplying means coupled to said detecting means for supplying power to the audio amplifier, to the bias circuit, to the tape running means and to the power amplifier until the detecting means generates a detection signal at which time the first power supplying means is rendered off to stop supplying said power; and

second power supplying means coupled to said detecting

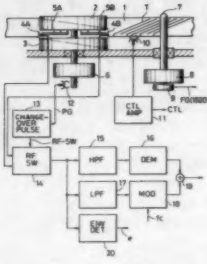
means for supplying power to the power amplifier and to the alarm means only for a predetermined period of time after the detection signal is generated.

---

## 4,370,685
## HEAD TRACKING CONTROL SYSTEM FOR A HELICAL SCAN VTR

**Sadao Hosoi, Ebina, and Masayuki Takano, Hon, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Mar. 13, 1981, Ser. No. 243,352**
**Claims priority, application Japan, Mar. 13, 1980, 55-31900**
**Int. Cl.³ G11B *21/10, 5/52***
**U.S. Cl. 360—77** **23 Claims**




1. Apparatus for reproducing information signals recorded in successive parallel tracks on a record medium while the latter is advanced at a predetermined speed in a direction at an angle to the direction along said tracks, said apparatus comprising:

transducer means movable along each of the tracks in a scanning path from a beginning end to a concluding end thereof for reproducing the signals recorded therein;

transducer deflecting means for deflecting said transducer means in a direction transverse to the direction along the tracks;

drive signal means for producing a drive signal controlling said transducer deflecting means to deflect said transducer means for accurately moving along said tracks during a scanning operation thereby; and

phase compensation means for producing a phase compensation signal controlling said transducer deflecting means so as to preset said transducer means to the beginning of each track to be scanned during a non-scanning operation thereby, said phase compensation means including offset control means for producing an offset control signal as part of said phase compensation signal only when the speed of advancement of the record medium during reproducing is outside a predetermined range of speeds.

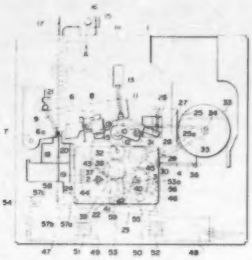
---

## 4,370,686
## DRIVE MECHANISM FOR TAPE RECORDER

**Noboru Katoh, Tokyo, and Akio Kimura, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jun. 18, 1980, Ser. No. 160,588**
**Claims priority, application Japan, Jun. 20, 1979, 54/77680**
**Int. Cl.³ G11B *5/008, 15/00***
**U.S. Cl. 360—96.3** **6 Claims**

1. A drive mechanism for a tape recorder comprising, a chassis, a magnetic head and a pinch roller movable from an inoperative position to an operative position to place a magnetic tape against said magnetic head, a transmission mechanism driven by a drive source and engageable with a supply and a take-up reel, respectively, for forming operational modes of quick feeding and rewinding, a slidable plate for supporting said transmission mechanism slidably mounted on said chassis and movable from a neutral position to a first operative position whereby said transmission mechanism is placed in engagement with said supply reel and movable from a neutral position to a second operative position whereby said transmission mechanism is in engagement with said take-up reel, spring means for biasing said slidable plate to said neutral position, a linkage mechanism linking a first plunger with said pinch roller when said slidable plate is in said neutral position, a second plunger connected to move said slidable plate from said neutral position to said first operative position, a third plunger connected to move said slidable plate from said neutral position to said second operative position, a locking means connected to said first plunger to be moved from a first position to a second position by said first plunger for locking said slidable plate in its said first and second operative positions against the biasing force provided by said spring means when said second or third plunger is de-energized.

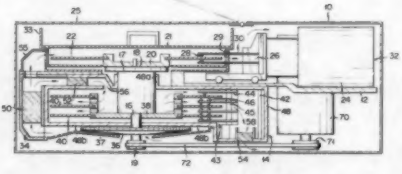


---

## 4,370,687
## MAGNETIC DISK APPARATUS

**Fumitake Shiraishi; Masahiko Fujioka, and Masao Fujiki, all of Hamura, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Continuation-in-part of Ser. No. 16,539, Mar. 1, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,799**
**Claims priority, application Japan, Mar. 9, 1978, 53-25995**
**Int. Cl.³ G11B *5/012, 23/02***
**U.S. Cl. 360—98** **3 Claims**



1. A magnetic disk apparatus comprising a base casting; a sealed enclosure removably secured on one side of the base casting; a drive spindle rotatably supported by the enclosure and having one end exposed on the opposite side of the base casting; means for rotating the drive spindle; fixed disk means received in the enclosure and connected to the drive spindle; first magnetic head means cooperable with said fixed disk means; a flange supported on said one end of the drive spindle; removable disk means interchangeably mounted on said flange; second magnetic head means cooperable with said removable disk means; a first head-positioning device received in the enclosure and operable to shift said first magnetic head means to a desired track formed in the fixed disk means; a second head-positioning device mounted on the base casting for shifting said second magnetic head means to a desired track formed

in the removable disk means; and means for controlling the operation of the first and second magnetic head-positioning devices independently of one another.

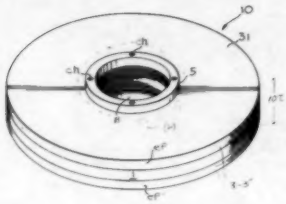
---

4,370,688

## FLOPPY PACK WITH ENHANCED ORIFICE MEANS

Harvey J. Richardson, Sepulveda, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 3, 1980, Ser. No. 156,199
Int. Cl.³ G11B 23/02, 25/04
U.S. Cl. 360—99 15 Claims



1. In an improved pack of flexible disks adapted to be pneumatically partitioned axially and wherein the disks are formed with gas-conducting apertures therethrough, the improvement therewith of rim means disposed in each gap defined between adjacent disks, and about adjacent apertures between respective disks, the rim means comprising "full-rim" annuli about certain apertures, being adapted to isolate the gap from the gas stream passing axially-up through certain "isolated" ones of said apertures, and certain other diverting "partial-rim" annuli only partly encircling other "entry" ones of said apertures communicating penumatically with the subject gap to divert gas into the respective inter-disk gap rather than across this gap; these annuli also providing a reference platform against which the disks may be pressed; and wherein enlargement means characterize at least some of said "entry" apertures, so as to facilitate increased gas flow therethrough.

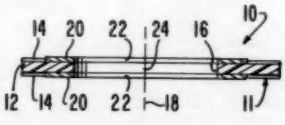
---

4,370,689

## FLEXIBLE MAGNETIC RECORDING MEDIUM WITH IMPROVED REINFORCEMENT MEANS

Charles A. Davies, Los Gatos, Calif., assignor to Dysan Corporation, Santa Clara, Calif.

Filed Aug. 4, 1980, Ser. No. 174,966
Int. Cl.³ G11B 5/02; B44C 31/00
U.S. Cl. 360—135 11 Claims




1. A magnetic recording medium comprising: a flexible body having a pair of opposed surfaces with a magnetic recording layer on at least one of said surfaces, and a central hole therethrough; and an annular reinforcing member of a material capable of being hot stamped, the member being hot stamped to one side of the body in surrounding relationship to the hole.

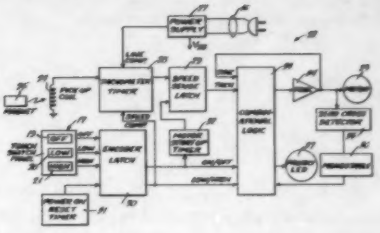


4,370,690

## VACUUM CLEANER CONTROL

Daniel A. Baker, St. Louis Park, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 6, 1981, Ser. No. 231,992
Int. Cl.³ H02H 7/093
U.S. Cl. 361—23 14 Claims



1. In a vacuum cleaner having a suction means including an alternating current motor, a rotatable beater brush and drive means for driving the brush as an incident of rotation of said motor, an improved control for controlling the operation of said motor comprising:

gated electronic switch means connected to the motor for controlling energization thereof;

touch switch means for selectively controlling the gated switch means to provide a high speed operation thereof and a low speed operation thereof;

sensing means for sensing the speed of rotation of the beater brush; and

means for turning off said switch means to terminate operation of the motor when the speed sensed by said sensing means is below a first preselected speed when the gated switch means is arranged to cause high speed operation of the motor, and to terminate operation of the motor when the speed sensed by said sensing means is below a second, lower preselected speed when the gated switch means is arranged to cause low speed operation of the motor, said second preselected speed being caused to be lower than said first preselected speed independently of changes in the voltage conditions of said suction means motor during normal operation thereof.

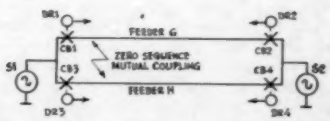
---

4,370,691

## PROTECTION APPARATUS FOR ELECTRIC POWER TRANSMISSION SYSTEMS

Adrian O. Newbould, Hixon, England, assignor to The General Electric Company Limited, London, England

Filed Mar. 23, 1981, Ser. No. 246,374
Claims priority, application United Kingdom, Mar. 21, 1980, 8009709
Int. Cl.³ H02H 7/00
U.S. Cl. 361—62 6 Claims




1. A protection apparatus for a feeder of an electric power transmission system incorporating compensation for mutual coupling between the feeder and another feeder including: means for deriving a first signal representative of the zero sequence current in a feeder to be protected by the apparatus; means for deriving a second signal representative of the zero

sequence current in another feeder with which the protected feeder is mutually coupled; and means responsive to said first and second signals to produce a signal for compensating for said mutual coupling, said mutual coupling compensation signal being proportional to the zero sequence current in the other feeder when the ratio of the zero sequence currents in the other feeder and the protected feeder is below a predetermined value, and when said ratio is above said predetermined value being limited to a value proportional to the protected feeder zero sequence current.

---

**4,370,692**

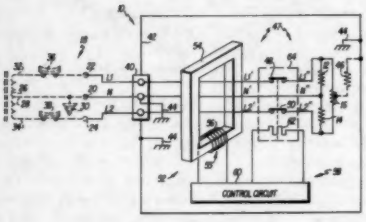
## GROUND FAULT PROTECTIVE SYSTEM REQUIRING REDUCED CURRENT-INTERRUPTING CAPABILITY

**Carl E. Wellman, Jr., and Richard E. Hornung, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.**

**Continuation of Ser. No. 951,892, Oct. 16, 1978. This application Jul. 13, 1981, Ser. No. 282,574**

**Int. Cl.³ H05B *9/00***

**U.S. Cl. 361—109** **16 Claims**




1. An electric range including at least one sheathed electrical resistance heating unit of the type having a spiralled electrical resistance wire encased within an elongated ceramic-filled metal outer sheath connected to a ground reference point, said electric range further including load-supplying conductors adapted to be supplied from a power source having a first overcurrent interruption means for interrupting the power source when a predetermined current threshold is exceeded, said electric range being subject to a first class of failure characterized by a breakdown or an initial failure stage in the form of an incipient breakdown in the electrical insulation qualities of the ceramic material within said outer sheath with consequent excessive current flow between at least one of said conductors and the ground reference point with circuit current remaining at or below the predetermined current threshold and circuit current remaining below that of a major arcing ground fault, said electric range being subject to a second class of failure characterized by current through at least one of said conductors being above the predetermined current threshold, and said electric range comprising:

second means for interrupting at least one of said conductors in response to excessive current flow characteristic of an incipient ground fault between one of said conductors and the ground reference point, said second means for interrupting operating sufficiently quickly to potentially avoid failure of the heating unit beyond the incipient ground fault stage, and said second means for interrupting including means for preventing conductor interruption thereby in the event a failure of the second class occurs.

**4,370,693**

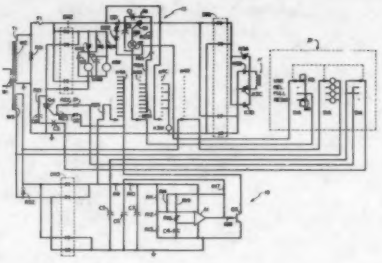
## DEMAGNETIZING APPARATUS FOR A WORKPIECE HOLDING ELECTROMAGNET

**Donald C. McDonald; Roger B. Ela, and Dominic F. Pignataro, all of c/o Walker Magnetics Group, Inc., Rockdale St., Worcester, Mass. 01606**

**Continuation-in-part of Ser. No. 67,366, Aug. 17, 1979. This application Jan. 2, 1981, Ser. No. 221,990**

**Int. Cl.³ H01F *13/00***

**U.S. Cl. 361—145** **15 Claims**



1. Apparatus for generating a sequence of energizations of the winding of an electromagnet to effect release, by the electromagnet, of a magnetizable workpiece, said apparatus comprising:

phase sensitive power control means providing alternating current of variable average voltage from an a.c. supply voltage of fixed amplitude;

a full wave rectifier means interconnected with said power control means for proving variable direct current from said variable alternating current;

a current reversing switch circuit for connecting the d.c. output of said rectifier means to said electromagnet in either a forward or a reverse direction;

sequential switching means including a first portion for progressively changing the phase setting of said power control means upon successive actuations and a second portion for reversing the polarity of magnetization of said magnet winding by said switch circuit upon successive actuations of said switching means; and

means for periodically actuating said sequential switching means.

---

**4,370,694**

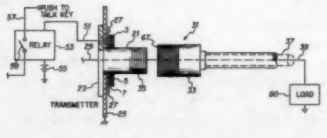
## ELECTRICAL INTERLOCK

**Thomas A. Hargrave, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Oct. 3, 1980, Ser. No. 193,874**

**Int. Cl.³ H01R *13/44***

**U.S. Cl. 361—179** **4 Claims**




1. An electrical interlock comprising:

protection circuit means for protecting electrical equipment;

a male type connector with an external conductor shaped to provide a first fastener means;

a flat insulated spacer means for mounting on the male type connector the flat insulated spacer mean includes; an electrical insulator shaped as a washer with a first center opening—an electrical conductor shaped as a washer with

a second center opening having a greater diameter than the first center opening—mounting means for mounting the electrical conductor on the insulator—and connector means for connecting the electrical conductor to the protection circuit means to provide an electrical contact thereby;

a female type connector with an external conductor shaped to provide a second fastener means acceptable to the first fastener means; and

the protection circuit means being connected to the electrical conductor whereby when said first fastener means is engaged with the second fastener means, the protection circuit is deactivated to enable the use of the electrical equipment.

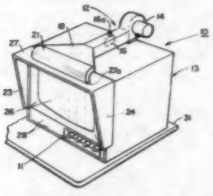
---

**4,370,695**

## APPARATUS FOR PREVENTING ELECTROSTATIC CHARGE BUILD-UP ON CRT MONITORS

**Loren C. Penick, Naperville, Ill., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed Oct. 28, 1980, Ser. No. 201,645**
**Int. Cl.³ H05F *3/06***
**U.S. Cl. 361—213** **43 Claims**



1. A CRT monitor assembly comprising:

a CRT monitor which includes a display screen that normally inherently tends to build-up a relative high electrostatic charge on the surface thereof when said monitor is energized, and

a de-ionizing air generating system for preventing electrostatic charge build-up on said monitor, said system including:

a. first means, comprising an electrically operated ionized air blower having at least one output port, and

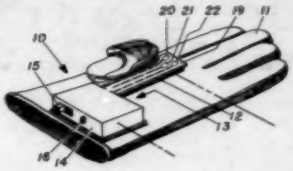
b. second means coupled to said first means for initially receiving, then fanning out and forming said supply of ionized air into a thin stream of de-ionizing air, with the latter being directed immediately adjacent to, and across, said screen from one predetermined edge to and beyond the opposite edge thereof, said second means including a thin, wedge-shaped fan-out nozzle portion, and a wide, thin arcuate forming nozzle portion that communicates with both the outer end of said fan-out nozzle portion and the predetermined edge of said monitor screen, said forming nozzle portion being contoured so as to re-direct said stream of de-ionizing air at a relatively sharp angle from a first trajectory after passing through said fan-out nozzle portion to a second trajectory substantially parallel as well as adjacent to the surface of said monitor screen, the proximity of said stream of de-ionizing air to said screen preventing the build-up of detrimental electrostatic charge on the surface of the latter.

**4,370,696**

## ELECTRIFIED GLOVE

**Miklos Darrell, 7311 Denny Ave., Sun Valley, Calif. 91352**

**Filed May 26, 1981, Ser. No. 266,886**
**Int. Cl.³ F41B *15/04***
**U.S. Cl. 361—232** **7 Claims**



1. An electrified device for temporarily incapacitating an individual or animal, comprising:

(a) a battery;

(b) transformer means for increasing voltage and reducing amperage from the battery;

(c) a transistor oscillator for converting D.C. voltage to A.C. voltage to power the transformer and produce a continuous A.C. voltage output;

(d) a rectifier and charging capacitor for converting a portion of the A.C. output to an intermittent D.C. output; and,

(e) open terminal output means connecting to the A.C. and D.C. outputs, the transistor oscillator being connected directly through the capacitor to the terminal means;

whereby, an individual or animal who contacts the open terminals will be temporarily incapacitated, and the transistor oscillator will be buffered by the charging capacitor against reflected impedance signals due to contact with the terminals and thereby maintain continuous operation of the oscillator.

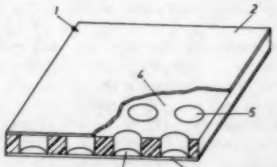
---

**4,370,697**

## CAPACITOR FOR MEASURING FORCES

**Rainer Haberl, Traiskirchen, and Josef Kastner, Vienna, both of Austria, assignors to Semperit AG, Traiskirchen, Aus.ria**

**Continuation-in-part of Ser. No. 870,476, Jan. 18, 1978, Pat. No. 4,266,263. This application Nov. 3, 1980, Ser. No. 203,102**
**Claims priority, application Switzerland, Jan. 21, 1977, 730/77**
**The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.**
**Int. Cl.³ H01G *7/00***
**U.S. Cl. 361—283** **9 Claims**



1. A capacitor for measuring external pressure comprising:

a pair of electrically conductive electrodes;

an elastomeric dielectric comprising a web arranged between said electrodes;

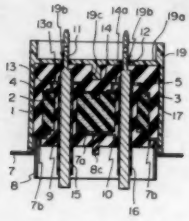
seal means for sealing said elastomeric dielectric; and

said web having at least one face thereof protruding nap-shaped protuberances defining a hollow space which is at a reduced pressure in relation to the external pressure.

## 4,370,698
## THROUGH TYPE HIGH-WITHSTAND-VOLTAGE CERAMIC

Setsuo Sasaki, Nikaho, Japan, assignor to TDK Electronics Co., Ltd., Japan

Filed Aug. 12, 1980, Ser. No. 177,374
Claims priority, application Japan, Oct. 8, 1979, 54/139387[U]; Dec. 17, 1979, 54/174705[U]; Jan. 19, 1980, 55/5103[U]
Int. Cl.³ H01G 4/42
U.S. Cl. 361—330 18 Claims



1. A through type twin high-withstand-voltage ceramic capacitor comprising;

(a) a rectangular ground conductor plate unit (7) having a plate (7*c*) and an elevated substantially elliptic portion (7*a*) elevated from said plate (7*c*), said elevated portion (7*a*) having a plurality of relatively small holes (7*b*) on the closed peripheral line of the elevated portion (7*a*) and a pair of relatively larger holes (9, 10),

(b) a capacitor half assembly having a substantially elliptic column shaped ceramic body (1), a pair of separated electrodes (4, 5) disposed on the upper surface of said ceramic body, and a common electrode (6) disposed on the bottom surface of said ceramic body (1), said ceramic body (1) and the electrodes (4, 5, 6) disposed thereon having a pair of common holes (2, 3) therethrough in the thick vertical direction of the ceramic body (1), and said capacitor half assembly being disposed on said elevated portion (7*a*) within the range defined by said relatively small holes (7*b*),

(c) a pair of circular caps (13, 14) each having an elevated portion (13*a*, 14*a*) being provided on the closed peripheral line of each of said caps (13, 14), said caps (13, 14) being disposed on each of said separated electrodes (4, 5), respectively,

(d) a pair of conductive rods (11, 12) each respectively passing through a hole of said ground conductor plate unit (7), the capacitor half assembly and the cap (13, 14), and said conductor rods being fixed to said caps,

(e) a pair of insulation tubes (15, 16) covering the conductive rods (11, 12) so that those conductive rods (11, 12) do not electrically contact the common electrode (6) and the ground conductor plate unit (7),

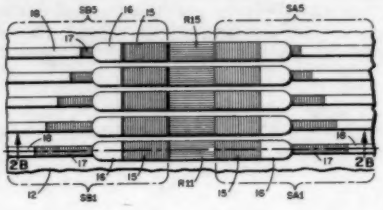
(f) a hollow substantially elliptic column shaped plastic cover (8) positioned below said ground conductor plate unit (7) covering said insulation tubes (15, 16), said cover (8) having a bridge (8*c*) across a pair of substantially parallel side walls (8*a*, 8*b*) of said cover (8) so that said bridge (8*c*) separates the cross section of the cover (8) into two generally circular areas,

(g) an insulator (17) injected into said cover (8), and said holes (2, 3) of the capacitor half assembly, also enclosing said capacitor half assembly.

## 4,370,699
## PRINTED WIRING BOARD FOR RECORDING OR DISPLAYING INFORMATION

Tamio Saito, Oume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 28, 1980, Ser. No. 211,450
Claims priority, application Japan, Nov. 28, 1979, 54/153857
Int. Cl.³ H05K 1/16
U.S. Cl. 361—406 16 Claims



1. A printed wiring board for recording or displaying information comprising:

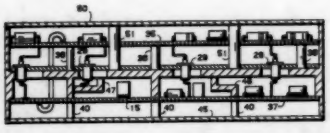
an insulated substrate;

a plurality of functional elements placed on said insulated substrate, each of said strip wires connected to a respective functional element, and at least two of the strip wires having different lengths such that one is longer than the other, each of said strip wires comprising a first portion having a first resistivity, wherein the resistance of the second portion of said shorter strip wire is higher than the resistance of the second portion of said longer strip wire, and the resistance of the first portion of said longer strip wire is higher than the resistance of the first portion of said shorter strip wire so that the total resistance of the shorter strip wire is substantially equal to the total resistance of the longer strip wire.

## 4,370,700
## RF PACKAGE INCLUDING RF SHIELDING FOR A MULTIPLE PC BOARD

Allen L. Duddles, Tempe, and Daniel G. Toomey, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg

Continuation of Ser. No. 156,156, Jun. 3, 1980, abandoned. This application Nov. 13, 1981, Ser. No. 321,287
Int. Cl.³ H02B 1/08
U.S. Cl. 361—424 4 Claims



1. Apparatus for assembling into an RF package for RF shielding a printed circuit board having a plurality of circuits thereon requiring shielding from each other and from the surroundings, said apparatus comprising:

(a) base means formed with at least electrically conductive surfaces and having a planar wall adapted to be positioned parallel with the printed circuit board and at least coextensive therewith and upright walls formed as an integral part of said planar wall and generally perpendicular thereto, outer portions of said upright walls defining one compartment for fixedly receiving the printed circuit board therein in overlying parallel, spaced apart relationship with respect to said planar wall and inner portions of said upright walls extending from said planar wall a shorter

distance than said outer portions further defining a plurality of subcompartments within the one compartment wherein said inner portions of said upright walls extend from said planar wall for abutting engagement with one side of the printed circuit board and for encircling each of the plurality of circuits thereon;

(b) the planar wall being formed with at least one opening therethrough and the apparatus further including an electrically conductive planar member having at least one feedthrough component mounted thereon, said planar member being fixedly mounted on said planar wall in overlying relationship with the opening therethrough;

(c) cover means for being affixed to said upright walls of said base means in parallel spaced apart relationship with respect to said planar wall and cooperating with said outer portions of said upright walls for defining a single compartment between the printed circuit board, said upright walls and said cover means and for substantially enclosing the printed circuit board; and

(d) wall means formed with at least electrically conductive surfaces and for mounting between said cover means and the printed circuit board in electrical contact with said cover means, generally parallel with said upright walls and for mounting in abutting engagement with the other side of the printed circuit board so as to divide the single compartment into subcompartments for generally encircling each of the plurality of circuits on the printed circuit board.

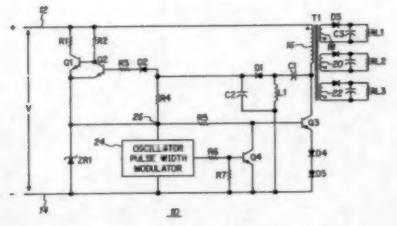
---

**4,370,701**

## ENERGY CONSERVING DRIVE CIRCUIT FOR SWITCHED MODE CONVERTER UTILIZING CURRENT SNUBBER APPARATUS

**Ralph E. Western, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Apr. 24, 1981, Ser. No. 257,287**
**Int. Cl.³ H02M** *3/335*
**U.S. Cl. 363—20** **3 Claims**




1. A switched mode power converter comprising, in combination:

transformer means;

main power switch means, connected to said transformer means, for controlling conduction of primary current therethrough in accordance with an input control signal supplied thereto; and

non-dissipative snubber means, connected to said transformer means and said main power switch means, for converting transformer leakage inductance energy to drive said main power switch, said non-dissipative snubber means comprising,

a first capacitor C1 charged by said transformer leakage inductance energy upon each turn-OFF of said main power switch;

a second layer capacitor C2 charged in increments through C1 until a given threshold charge level is reached in C2 after a plurality of ON-OFF cycles of said main power switch;

an inductor connected to said C1 and C2 capacitors for limiting discharge of C1 through said main power switch means when the latter is in an ON condition; and

a diode connected between C1 and C2 and poled in series-aiding direction from C1 to C2 to permit charging of C2 through C1 but to prevent discharge of C2 through C1 whereby the snubber means acts as a step-down voltage device to supply useful low voltages to said switch means in a non-dissipative fashion.

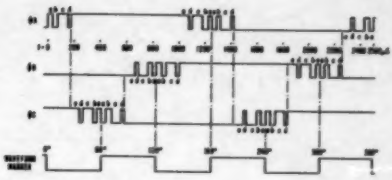
---

**4,370,702**

## MICROPROCESSOR CONTROL OF INVERTER POWER TRANSISTORS WITH DC CONTENT CORRECTION

**Kenneth C. Shuey, Cridersville, and Mark A. Rosswurm, Jackson Township, Hardin County, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jan. 15, 1981, Ser. No. 225,225**
**Int. Cl.³ H02P** *13/20;* **H02M** *1/12*
**U.S. Cl. 363—42** **10 Claims**



1. Apparatus for generating an AC waveform from a DC source comprising:

means for generating a series of clock pulses at fixed intervals;

a pair of electronic switches connected to said DC source to generate an output of one polarity when one of said switches is turned on and an output of the opposite polarity when the other switch is turned on;

means for filtering the output of said electronic switches to generate a filtered output waveform;

means for detecting a DC content in the filtered output waveform including the polarity thereof; and

means for switching said electronic switches such that alternately one is on and then the other with said switching occuring at selected intervals which are multiples of the clock pulses and which produce a sinusoidal filtered output waveform, and for modifying the selected switching intervals in response to the detection of a DC content in said filtered output waveform by delaying by a predetermined multiple of said clock pulses the switching on of the electronic switch which generates an output of the same polarity as the DC component and by advancing by said predetermined multiple of said clock pulses the switching on of the electronic switch which generates an output opposite in polarity to that of the DC content.

---

**4,370,703**

## SOLID STATE FREQUENCY CONVERTER

**Robert L. Risberg, Milwaukee, Wis., assignor to Park-Ohio Industries, Inc., Cleveland, Ohio**

**Filed Jul. 20, 1981, Ser. No. 285,355**
**Int. Cl.³ H02M** *7/515;* **H05B** *6/02*
**U.S. Cl. 363—136** **12 Claims**

1. A solid state frequency converter comprising:

a diamond chain including a plurality of N diamond circuits coupled in series, each said diamond circuit comprising a capacitor having first and second terminals and first through fourth unidirectional switching elements each having input, output and control terminals and conducting from input to output in response to a control terminal signal, the input terminals of said first and third switching elements being coupled together to form a diamond cir-

cuit input terminal, the output terminals of said second and fourth switching elements being coupled together to form a diamond circuit output terminal, the output terminal of said first switching element and input terminal of said fourth switching element being coupled to said first capacitor terminal, and the output terminal of said third switching element and input terminal of said second switching element being coupled to said second capacitor terminal, said N diamond circuits being connected in series;

constant current source means for providing a substantially constant current to said diamond chain;

means for providing control signals to said switching elements, the control signals to said first and second switching elements in any one diamond circuit being substantially simultaneous, the control signals to said third and fourth switching elements in said one diamond circuit being substantially simultaneous and 180° out-of-phase with respect to said first and second switching element control signals, and the control signals in each said diamond circuit being shifted in phase with respect to the control signals provided to the switching elements in the remaining diamond circuits, thereby generating a voltage across the input and output terminals of said diamond chain which has a frequency of 2 N times the switching frequency of any one switching element; and

a resonant load coupled to said diamond chain.

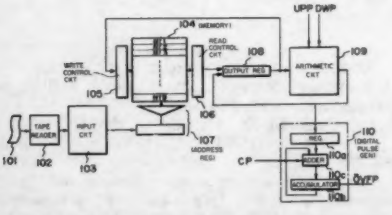
---

**4,370,704**

## FEED SPEED CONTROL SYSTEM

**Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Sep. 2, 1980, Ser. No. 183,036**
**Claims priority, application Japan, Sep. 4, 1979, 54-113261**
**Int. Cl.³ G05B *19/18***
**U.S. Cl. 364—171** **19 Claims**



1. A feed speed control system for controlling the feed speed of a movable member, comprising:

memory means for storing a plurality of numerical values corresponding to feed speeds;

command means, operatively connected to said memory means, for issuing a command signal indicative of a selected numerical value from among the plurality of numerical values stored in said memory means;

manual operation means for providing an adjustment pulse;

arithmetic means, operatively connected to said memory means, for reading the selected numerical value from said memory means and for incrementing or decrementing the selected numerical value read from said memory means in response to the adjustment pulse from said manual operation means; and

pulse generating means, operatively connected to said arithmetic means, for generating output pulses of a frequency which is proportional to the incremented or decremented selected numerical value from said arithmetic means, the frequency of said output pulses corresponding to the feed speed.

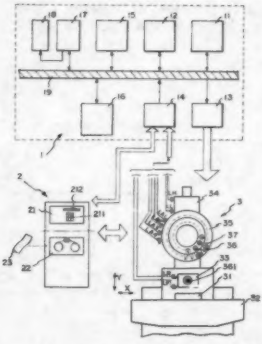
---

**4,370,705**

## SEQUENCE CONTROL SYSTEM FOR NUMERICALLY CONTROLLED MACHINE TOOL

**Ryoji Imazeki, Hachioji; Katsuaki Kusumi, Kawasaki, and Yoshihiro Nakajima, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Sep. 10, 1980, Ser. No. 185,809**
**Claims priority, application Japan, Sep. 18, 1979, 54/119628**
**Int. Cl.³ G06F *13/00***
**U.S. Cl. 364—184** **4 Claims**



1. A numerical control system for a numerically controlled machine tool whose sequence operation results from command data applied to the machine tool from an NC unit and is controlled through a programmable sequence controller interposed between the NC unit and the machine tool comprising:

a first non-volatile storage area means, provided in the programmable sequence controller, for storing command data applied to the machine tool;

a second non-volatile storage area means, provided in the programmable sequence controller, for storing a duplicate of the command data stored in said first non-volatile storage area means when the machine tool issues a signal indicating that it has completed an operation in accordance with the command data; and

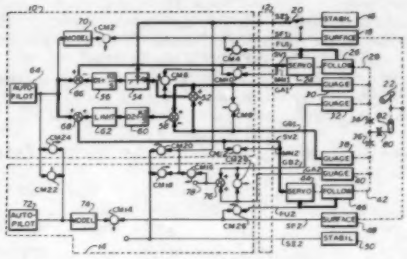
a comparator means, provided in the programmable sequence controller, for comparing the contents of said first and second non-volatile storage area means, when electric power is connected to the machine tool.

4,370,706

## CONTROLLER FOR A DUAL SERVO SYSTEM

Jerry Doniger; Albert T. Kirchhein, both of Montvale, N.J., and Gibson Reynolds, Tuxedo, N.Y., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 26, 1980, Ser. No. 191,231
Int. Cl.³ G05B 9/02; G06F 11/16
U.S. Cl. 364—184 24 Claims



1. In a dual servo system for driving a controlled element with mechanically coupled first and second servos in response to a pair of control signals separately applied thereto, said servos cooperating with a sensing means for providing a signal signifying on operating parameter associated with at least one of said servos, a controller comprising:

first digital processing means connected to said first and second servos for simultaneously driving them by providing to each a corresponding one of said control signals, said first digital processing means being operable to measure the responsiveness of said servos to said first digital processing means to provide a self-checking indication; and

second digital processing means connected to said first digital processing means for measuring the responsiveness of said servos to said first digital processing means to provide an independent indication of failure of said responsiveness, said independent indication being provided by at least one signal comparison, examining the signal of said sensing means but neither of said control signals.

---

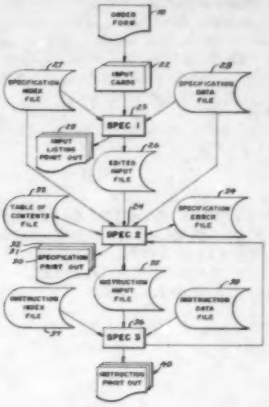
4,370,707

## COMPUTER SYSTEM FOR GENERATING ARCHITECTURAL SPECIFICATIONS AND PROJECT CONTROL INSTRUCTIONS

Clarence W. Phillips, Canton; Michael R. Eiben, Chicago, and Harvey T. Morgan, Jr., Oak Park, all of Ill., assignors to Computer Service, Inc., Chicago, Ill.

Filed Aug. 3, 1971, Ser. No. 168,711
Int. Cl.³ G06F 15/21
U.S. Cl. 364—200 17 Claims

1. An automated system for preparing a printed architectural specification and related instructions comprising: a master catalog including a large number of printed phrases indicating materials and construction techniques from which a specifier may choose, each phrase having associated with it a short code; order form means on which a specifier may record code selected from said catalog and representative of a desired sequence of said phrases; data processing means adapted to receive input signals representative of the code prepared by the specifier and including a Specification Data File storing signals representative of said phrases; Specification Index File means addressable by said data processing means and storing signals representative of the locations of said phrases in said Specification Data File; instruction file means storing signals representative of prepared instructions for predetermined ones of said phrases and correlated with said phrases by code; and program means for operating said data processing means for receiving said input signals representative of said code, for referencing said Specification Index File to obtain the location of phrases called for by said input code in said Specification Data File, for printing an output specification incorporating said phrases



from said Specification Data File as determined by the input code, and for printing out instructions from said instruction file means corresponding to said printed specification as determined by said input code.

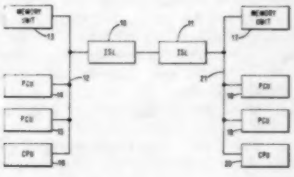
---

4,370,708

## LOGIC SYSTEM FOR SELECTIVELY RECONFIGURING AN INTERSYSTEM COMMUNICATION LINK

Kenneth E. Bruce, Nashua, N.H.; John W. Conway, Waltham, Mass.; Ralph M. Lombardo, Jr., Lowell, Mass., and Bruce H. Tarbox, Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 956,381, Oct. 31, 1978, abandoned.
This application Jan. 7, 1980, Ser. No. 110,000
Int. Cl.³ G06F 3/04
U.S. Cl. 364—200 2 Claims



1. Intersystem link (ISL) unit architecture wherein an ISL unit may be selectively reconfigured to accommodate information transfers between a local communication bus and any data processing unit including memory units, peripheral control units, central processing units and ISL units in electrical communication with any of plural communication busses in a data processing system wherein each of said plural communication busses are in electrical communication with an ISL unit and ISL units are in electrical communication in pairs, which comprises:

(a) cycle control logic means responsive to communication bus requests and to an output control command from a CPU in electrical communication with one of said plural communication busses for transitioning an addressed ISL unit between an on-line logic state and a stop logic state wherein said addressed ISL unit may respond to pending communication bus requests while inhibiting further communication bus requests;

(b) programmable memory means in electrical communication with said one of said plural communication busses and having memory cell locations for storing binary coded information received from any one of said plural communication busses for accommodating information transfers between said plural communication busses; and

(c) configuration control logic means responsive to said cycle control logic means for altering binary coded information stored in selected ones of said memory cell locations of said programmable memory means in accordance with configuration data received from said CPU, thereby providing a dynamic reassignment of data processing system resources between said plural communication busses.

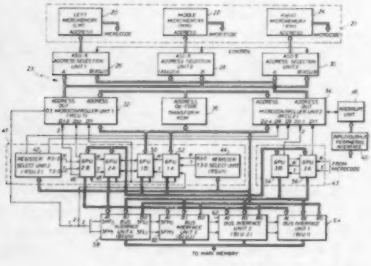
---

**4,370,709**

## COMPUTER EMULATOR WITH THREE SEGMENT MICROCODE MEMORY AND TWO SEPARATE MICROCONTROLLERS FOR OPERAND DERIVATION AND EXECUTION PHASES

**Robert E. Fosdick, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.**

**Filed Aug. 1, 1980, Ser. No. 174,721**
**Int. Cl.³ G06F *9/44, 9/22, 9/46***
**U.S. Cl. 364—200** **7 Claims**



2. A microcoded computer emulator for executing instructions of a target computer where the instructions are stored in a memory and each instruction is capable of referencing an operand address location, comprising:

(a) a micromemory including a right, a middle and a left micromemory unit for storing microcode which controls the resource circuits of the emulator,

(i) each said micromemory unit controlling separate emulator resources and each responsive to a separate micromemory address,

(ii) the emulator executing each instruction by dividing each instruction into an operand address derivation phase and an instruction execution phase, and

(iii) where said left micromemory unit is associated with the execution phase and said right micromemory unit is associated with the operand address derivation phase, with said middle micromemory unit providing shared microcode therebetween;

(b) a pair of microcontrollers, one associated with the operand address derivation phase and one associated with the instruction execution phase, and each responsive to said microcode for generating the next micromemory address for each micromemory unit;

(c) a plurality of address selection units each responsive to the microcode and to the micromemory address from said microcontrollers, and each addressing an associated one of said micromemory units, for temporarily storing and outputting to its associated micromemory unit, a micromemory address from either one of said microcontrollers whereby each said microcontroller may obtain control of the emulator resource circuits associated with said middle micromemory unit when those resources are needed to perform the operations for its respective phase;

(d) an op-code mapping means responsive to the instructions, for mapping each instruction into said micromemory at the starting addresses of microcoded routines which will control the operand address derivation and instruction execution phases for each instruction; and

(e) a processing means responsive to the microcode for performing the logical operations required in each phase to emulate the instructions of the target computer.

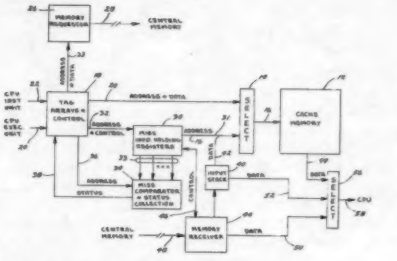
---

**4,370,710**

## CACHE MEMORY ORGANIZATION UTILIZING MISS INFORMATION HOLDING REGISTERS TO PREVENT LOCKUP FROM CACHE MISSES

**David Kroft, Thornhill, Canada, assignor to Control Data Corporation, Minneapolis, Minn.**

**Filed Aug. 26, 1980, Ser. No. 181,529**
**Int. Cl.³ G06F *13/00***
**U.S. Cl. 364—200** **7 Claims**



1. A cache memory organization comprised of;

a cache memory unit,

selection unit means for selecting the input to said cache memory unit,

a tag arrays and control unit means connected to and for providing a first data input for forming a first address input to said selection unit means,

input stack means connected to and for providing a second data input to said selection unit means,

a miss information holding registers unit connected to and for providing a third data input for forming a second address input to said selection unit means, wherein said miss information holding registers unit receives an input from said tag arrays and control unit means, wherein said miss information holding registers unit holds a predetermined number of required addresses not found in said cache memory unit when said cache memory unit is addressed and misses,

a miss information comparator and status collection network connected to said miss information registers holding unit and receiving input request and cache memory addresses from said tag arrays and control unit means and for providing status information to said tag arrays and control unit means,

a memory receiver unit for receiving data from a central memory of a computer system, said memory receiver unit being connected to said input stack means and to said miss information holding registers unit for providing addresses to said input stack means under control of said miss information holding registers unit,

an output selection network for the cache memory organization having a first input from the cache memory unit, a second input from said input stack means and a third input from said memory receiver unit wherein said cache memory organization is not locked up when said cache memory unit is addressed and misses by means of said miss information holding registers unit holding miss addresses until said memory receiver unit receives the required miss address information while said tag arrays and control unit

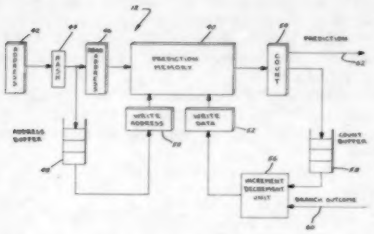
means continues to provide addresses to said cache memory unit through said selection unit means.

---

## 4,370,711
## BRANCH PREDICTOR USING RANDOM ACCESS MEMORY

**James E. Smith, Forest Lake, Minn., assignor to Control Data Corporation, Minneapolis, Minn.**

**Filed Oct. 21, 1980, Ser. No. 198,990**
**Int. Cl.³ G06F *9/42***
**U.S. Cl. 364—200** **5 Claims**




**1**. A branch prediction mechanism comprising

a prediction memory,

an instruction address receiving means,

a hash address device connected to receive instruction addresses from said instruction address receiving means,

an address register connected with said prediction memory and to said hash address device for receiving hash addresses from said hash address device,

an address buffer connected to said hash address device for receiving hash addresses from said hash address device,

a write hash address register connected to said address buffer for receiving hash addresses from said address buffer and connected to said prediction memory,

a count register connected to said prediction memory for receiving the output from said prediction memory,

a count buffer connected to said count register for receiving output counts from said count register,

an increment-decrement unit connected to said count buffer for receiving input counts from said count buffer and having an input for receiving branch outcome information for updating the count according to the branch outcome,

a write data register connected to said increment-decrement unit for receiving the updated count information from said increment-decrement unit said write data register being connected to said prediction memory to provide updated count information corresponding to the hash address in said write hash address register, and

wherein said branch prediction device operates to predict branch instructions on a continuously updated history of recently executed branch instructions.

---

## 4,370,712
## MEMORY CONTROLLER WITH ADDRESS INDEPENDENT BURST MODE CAPABILITY

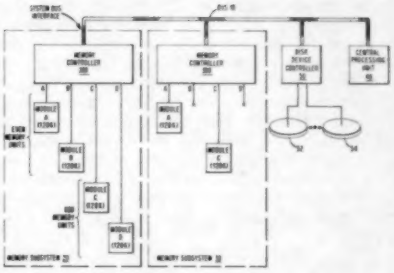
**Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Oct. 31, 1980, Ser. No. 202,409**
**Int. Cl.³ G06F *13/00, 13/06, 11/30*; G11C *7/00***
**U.S. Cl. 364—200** **38 Claims**

**26**. A memory controller for use in a system including a data processing unit and a high speed storage unit coupled to a bus in common with said controller, said controller being coupled to a plurality of memory modules, each including a plurality of word locations and said controller being operative to control the operation of said modules in response to memory requests generated by said units, said memory requests including burst memory requests, each coded to specify the read out of predetermined numbers of data words over successive memory cycles of operation by said controller independently of any memory address included within said request and each burst memory request including a memory address specifying where in said memory modules the read out of said words is to begin, said controller comprising:

a plurality of address counter circuits each being individually coupled to said bus for receiving a predetermined portion of a different one of said memory addresses and said each address counter circuit being operatively coupled to apply address signals to said plurality of modules for specifying numbers of locations to be addressed during each of said successive memory cycles of operation;

a plurality of mode control means, each coupled to a different one of said address counter circuits and to said bus, each of said plurality of mode control means when selected as available to process one of said burst requests being operative in response to said burst request to switch from a first state to a second state conditioning said controller for operating in a burst mode of operation, each of said mode control means only when in said second state generating signals for incrementing by one said predetermined address portion, the contents of said different one of said plurality of address counter circuits after each consecutive memory cycle of operation of said burst request enabling the read out of successive pairs of words from consecutive locations of said memory modules;



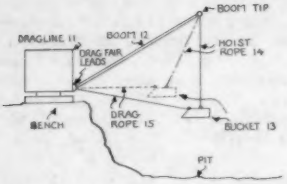
address boundary detection and signalling means coupled to said plurality of address counter circuits and to said bus for receiving another predetermined portion of said memory address; and,

said different one of said plurality of address counter circuits upon being incremented to a predetermined count generating an output signal indicating the termination of said burst mode operation, said address boundary detection and signalling means being operative in response to said output signal to generate a response signal on said bus in accordance with said another predetermined portion of said memory address, indicating to said unit whether or not said predetermined count exceeded the address boundary defined by said predetermined type of request and said each selected mode control means switching from said second state to said first state in response to said output signal indicative of the availability of said different one of said plurality of address counter circuits for processing another burst memory reqeest.

## 4,370,713
## ANTI-TIGHTLINE CONTROL SYSTEM AND METHOD FOR DRAGLINE TYPE EQUIPMENT

**Charles E. McCoy, Jr., Erie, Pa., and James L. Crowgey, Roanoke, Va., assignors to General Electric Co., Schenectady, N.Y.**

**Filed Aug. 11, 1980, Ser. No. 177,256**
**Int. Cl.³ G06F *15/46***
**U.S. Cl. 364—424** **33 Claims**



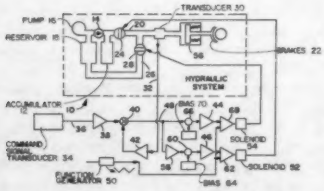

**11**. In a drive regulating system for controlling operation of the bucket means for dragline type equipment having respective hoist and drag rope means attached to the bucket means which can be taken-up or paid-out by respective hoist rope and drag rope pay-out and take-up means to control the positioning and operation of the bucket means, and respective operator controlled hoist and drag rope regulating control means for controlling operation of said respective hoist rope and drag rope pay-out and take-up means; the improvement comprising anti-tightline control system means for monitoring the respective lengths of the hoist and drag rope means paid-out or taken-up at any given time and the speed at which the hoist and drag rope means is being taken-up and for deriving a rope speed adjusted allowed combined hoist and drag rope length anti-tightline boundary limited control signal, and means for supplying said anti-tightline boundary limited control signal to said respective operator controlled hoist and drag rope regulating control means for overriding the operator control settings and maintaining operation of said dragline type equipment within constraints required to avoid a tightline operating condition.

---

## 4,370,714
## ELECTRONICALLY ACTUATED BRAKE SYSTEM

**Thomas A. Rettich, Monrovia, and Raymond D. Woodworth, Irvine, both of Calif., assignors to Minnesota Automotive, Inc., North Mankato, Minn.**

**Filed Aug. 25, 1980, Ser. No. 180,679**
**Int. Cl.³ B60T *8/02***
**U.S. Cl. 364—426** **13 Claims**




**1**. An electronically controlled brake system for a towed, wheeled vehicle having hydraulically actuated brakes comprising:

a self-contained hydraulic fluid brake actuating system located entirely on a towed, wheeled vehicle and including:

a high pressure hydraulic fluid supply means,

a high pressure hydraulic fluid supply line leading from said fluid supply means to said brakes,

a solenoid actuated inlet valve connected in said high pressure hydraulic fluid supply line,

a reduced pressure hydraulic fluid supply line leading from said brakes to said high pressure hydraulic fluid supply means,

a solenoid actuated outlet valve connected in said reduced pressure hydraulic fluid return line,

a hydraulic pressure transducer in communication with said brakes for providing an electrical feedback signal therefrom, a manual command signal transducer located external to said towed vehicle for producing an electrical command signal proportional to a desired pressure in said hydraulically actuated brakes,

differential amplification means coupled to receive said command signal and said feedback signal to provide an error signal, and

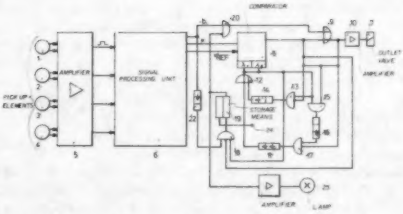
pulse width modulated control means coupled to selectively actuate the solenoids of said inlet and outlet valves in accordance with the polarity and magnitude of said error signal.

---

## 4,370,715
## ANTI-LOCK CONTROL SYSTEM

**Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation of Ser. No. 886,310, Mar. 13, 1978, abandoned. This application Jan. 29, 1981, Ser. No. 229,366**
**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713828**
**Int. Cl.³ B60T *8/10***
**U.S. Cl. 364—426** **4 Claims**




**1**. An anti-lock control system for the hydraulic braking system of a wheeled vehicle, comprising;

at least one pickup element for generating a wheel speed signal proportional to the speed of a vehicle wheel on at least one vehicle axle;

an evaluation circuit connected to an output of said pickup element for controlling fluid pressure in the wheel brake cylinders producing a control signal causing a lowering of fluid pressure when a threshold $\lambda_1$ or $\lambda_2$, wherein $\lambda_2 > \lambda_1$, between a vehicle speed reference and the wheel speed proportional signal is passed in the decreasing direction and wherein normally the threshold $\lambda_1$ is effective;

switching means having timing elements connected thereto, connected to respond to the presence of a brake fluid pressure lowering signal beyond a predetermined time $T_1$ for switching over for a given short time to a control state in which the $\lambda_2$ threshold is effective and thus switching said brake fluid pressure lowering signal only in the event that the differential between the vehicle speed signal and reference signal is greater than said higher threshold $\lambda_2$; and

testing means operative only when said $\lambda_2$ threshold becomes effective for determining the presence or absence of said pressure lowering signal, said testing means being adapted to maintain the switchover to the $\lambda_2$ threshold for a time period $T_2$ greater than $T_1$ when said pressure lower-

ing signal disappears after the switchover to the $\lambda_2$ threshold.

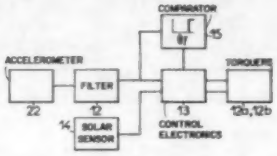
---

**4,370,716**

## ACTIVE NUTATION CONTROL SYSTEM FOR SPACE VEHICLE

**Jean-Claude Amieux, Voisins le Bretonneux, France, assignor to Matra, Paris, France**

**Filed Jan. 22, 1980, Ser. No. 114,197**
**Claims priority, application France, Jan. 23, 1979, 79 01663**
**Int. Cl.³ B64G 1/10; G05D 1/08**
**U.S. Cl. 364—434** **8 Claims**




**4**. An active nutation control system for a space vehicle spinning about one of its geometrical axes, having: means for creating pulses of external rocking torque about an axis transverse to said geometrical axis; means carried by said space vehicle for delivering a periodically varying signal having an amplitude representative of the magnitude of the nutation of said space vehicle and a frequency equal to the nutation frequency of said space vehicle; and control means for controlling the torque-creating means, comprising:

first enabling means to deliver a signal authorizing actuation of said torque creating means for delivering a pulse of predetermined time duration at times having a predetermined phase difference with respect to said periodically varying signal;

second enabling means to compare said periodically varying signal with a predetermined threshold and to deliver a signal when the amplitude of said signal exceeds said threshold;

third enabling means connected to receive signals representative of the pulses to be delivered by said torque-creating means for computing the cumulative change in the direction of the angular momentum of the space vehicle due to the actuation of said torque-creating means and to deliver a signal under conditions where the next pulse does not increase the angular discrepancy between the current direction of the angular momentum of the vehicle and the initial direction thereof;

and means responsive to the signals from said first, second and third means for causing delivery of one of said pulses upon simultaneous occurrences of all three signals.

---

**4,370,717**

## ELEVATOR BANK SIMULATION SYSTEM

**George T. Hummert, Oakmont; Thomas D. Moser, and David M. Edison, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 30, 1974, Ser. No. 510,940**
**Int. Cl.³ B66B 3/00; G06F 15/20**
**U.S. Cl. 364—436** **23 Claims**
**MICROFICHE APPENDIX INCLUDED**
**(6 Microfiche, 320 Pages)**

**1**. An elevator bank simulation system, comprising:

display means,

sequence controlling means,

and dispatcher means,

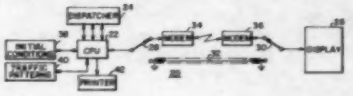
said display means including indicating means for visually displaying information relative to the operation of a simulated bank of elevator cars, and means for entering traffic requests,

said sequence controlling means including the following components: (a) display updating means, (b) dispatcher updating means, (c) simulation means, and (d) status means,

said display updating means being responsive to said traffic requests for providing signals for said display means which actuate said indicating means to visually display which traffic requests have been entered,

said dispatcher updating means providing signals for said dispatcher means relative to said traffic requests and to the status of the elevator cars of the simulated bank,

said dispatcher means including assignment means responsive to the signals provided by said sequence controlling means for developing assignment signals for the elevator cars of the simulated bank according to a predetermined strategy,




said simulation means being responsive to the assignment signals for simulating the response of the elevator cars to the assignment signals and for canceling traffic requests as they are served by the elevator cars,

said status means being responsive to the simulation means for providing signals for the dispatcher means indicative of the status of the elevator cars,

said display updating means providing signals for said display means which actuate said indicating means to visually display the simulated response of the elevator cars and the answering of traffic requests.

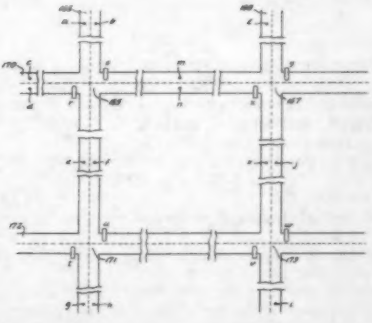
---

**4,370,718**

## RESPONSIVE TRAFFIC LIGHT CONTROL SYSTEM AND METHOD BASED ON CONSERVATION OF AGGREGATE MOMENTUM

**Norman E. Chasek, 24 Briar Brae Rd., Stamford, Conn. 06903**

**Continuation of Ser. No. 9,890, Feb. 6, 1979, abandoned, which is a continuation of Ser. No. 905,786, May 15, 1978, abandoned, which is a continuation of Ser. No. 702,091, Jul. 6, 1976, abandoned. This application Apr. 16, 1979, Ser. No. 30,345**
**Int. Cl.³ G08G 1/08**
**U.S. Cl. 364—436** **28 Claims**



**1**. A traffic control system for controlling vehicular traffic flow at an intersection of roadways with the objective of increasing the average vehicular velocity and reducing the average number of stops without compromising safety or introducing intolerably long delays for adversely affected vehicles comprising:

a multiplicity of sensors positioned for sensing aggregate vehicular momentum and congestion experienced for each of the vehicles passing through a predetermined zone on each such roadway upstream from the intersection,

processor means connected to the respective sensors for generating first and second sequences of pulses for each vehicle passing the sensed zone, in which each first sequence is representative of each vehicle's momentum, or preferably, its velocity times its incremental length, and each said second sequence is representative of the congestion experienced by each sensed vehicle,

first summing means connected to said processor means for generating a first running sum of the pulses in the successive first sequences, said first running sum being representative of aggregate momentum of the sensed vehicles on the respective roadway, and for generating a second running sum of the pulses in the successive second sequences, said second running sum being representative of the aggregate congestion experiences by the sensed vehicles on the respective roadway,

further summing means connected to said first summing means and to said second summing means for generating a third running sum of said first and second running sums for a roadway having a "go" signal and for providing only the first running sum for a roadway having a "stop" signal,

means for sensing whether the traffic control light facing a respective roadway is "go" or "stop",

forecasting means under control of said go/stop sensing means, and connected to said processor means for forecasting when the sensed vehicles on a respective roadway will likely pass through the intersection and for forecasting when the sensed vehicles on the respective roadway will likely become stopped at the intersection, said forecasting means being connected with said further summing means for subtracting from said third running sum respective portions of said first and second running sums representative of the contribution to aggregate momentum and aggregate congestion of the respective forecasted vehicles for producing a corrected third running sum for each roadway,

comparison means for comparing the respective corrected third running sum for each roadway, and

light timer means connected and under the control of to said comparison means for lengthening the "go" signal relative to the "stop" signal for the respective roadway having the greater corrected third running sum applicable thereto and for speeding up said timer means if the signal is on "stop" or slowing or stopping said timer means if the signal is on "go".

---

## 4,370,719
## CONTROL OF CENTRIFUGAL PIPE CASTING OPERATION

**Thurman H. Upchurch, Lynchburg, and Gerardo A. Bianco, Jr., Madison Heights, both of Va., assignors to AMSTED Industries Incorporated, Chicago, Ill.**

**Filed Nov. 17, 1980, Ser. No. 207,389**
**Int. Cl.³ G06F *15/46*; B22D *13/02***
**U.S. Cl. 364—472** **5 Claims**

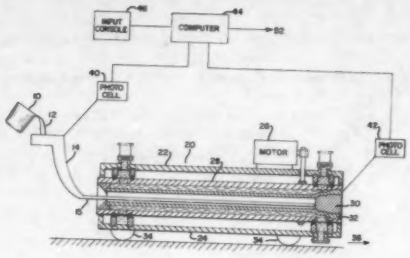
1. A method for controlling the centrifugal casting of a metal pipe including the steps of:

obtaining a first photoelectric cell signal when molten metal passes into a pouring trough,

obtaining a second photoelectric cell signal when molten metal passes to the end of the casting mold at the end of the pouring trough,

comparing said first and second photoelectric cell signals to determine the actual metal pouring flow time, comparing the actual pouring flow time with a stored standard pouring flow time,

increasing the bell end forming time for the metal pipe when the actual measured pouring flow time is greater than the standard pouring flow time, and decreasing the bell end forming time for the metal pipe when the actual measured



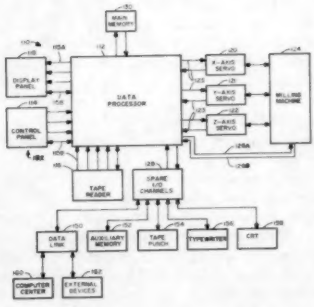

pouring flow time is less than the standard pouring flow time.

---

## 4,370,720
## COORDINATE ROTATION FOR NUMERICAL CONTROL SYSTEM

**Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803**

**Continuation-in-part of Ser. No. 101,881, Dec. 28, 1970, abandoned, Ser. No. 134,958, Apr. 19, 1971, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, and Ser. No. 230,872, Mar. 1, 1972. This application Mar. 7, 1972, Ser. No. 232,459**
**Int. Cl.³ G05B *19/18***
**U.S. Cl. 364—474** **28 Claims**




1. A machine control system comprising:

input means for providing object path end point signals;

an integrated circuit object memory for storing object path end point signals received from said input means;

rotation command means for providing a multi-dimensional rotation command signal;

translation command means for providing a multi-dimensional translation command signal;

an integrated circuit data processor for processing the object path end point signals stored in said object memory in real time in response to the multi-dimensional rotation command signal from said rotation command means and the multi-dimensional translation command signal from said translation command means to generate real time object control signals, said data processor including

a. multi-dimensional rotation processing means for performing multi-dimensional rotation processing of the object path end point signals from said object memory to generate multi-dimensional rotated object path end point signals in response to the multi-dimensional rotation command signal from said rotation command means,

b. multi-dimensional translation processing means for per-

forming multi-dimensional translation processing of the object path end point signals from said object memory to generate multi-dimensional translated object path end point signals in response to the multi-dimensional translation command signal from said translation command means,

c. multi-dimensional scaling processing means for performing multi-dimensional scaling processing of the object path end point signals processed with said multi-dimensional rotation processing means and with said multi-dimensional translation processing means to generate reduced multi-dimensional rotated and translated path signals,

d. path smoothing processing means for performing path smoothing processing of the multi-dimensional reduced rotated and translated path signals processed with said multi-dimensional scaling processing means to generate smoothed and reduced multi-dimensional rotated and translated path signals, and

e. output means for generating the real time object control signals as smoothed and reduced multi-dimensional rotated and translated path control signals in response to the smoothed and reduced multi-dimensional rotated and translated path signals from said path smoothing processing means; and

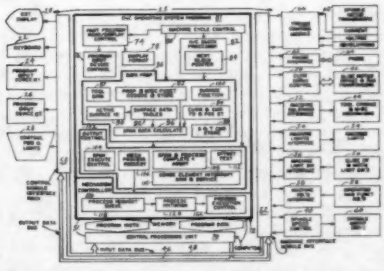
control means for controlling motion of multi-dimensional machine elements in response to the smoothed and reduced multi-dimensional rotated and translated path control signals from said output means.

---

## 4,370,721
## METHOD FOR MODIFYING PROGRAMMED POSITIONS BY USING A PROGRAMMABLY CONTROLLED SURFACE SENSING ELEMENT

**John A. Berenberg; William A. Haggerty; Richard L. Kegg, all of Cincinnati; Myron J. Schmenk, Milford, and Ralph C. Taylor, Jr., West Chester, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Sep. 2, 1980, Ser. No. 183,193**
**Int. Cl.³ G05B *19/18*; G06F *15/46***
**U.S. Cl. 364—474** **51 Claims**



1. A method for measuring the actual position of unmachined surfaces on a workpiece and modifying command signals derived from a machining program defining a cycle of operation of a machine relative to the unmachined surfaces, said machine having machine slides moving along axes of motion for effecting relative movement between the workpiece and a tool holder having a sensing element associated therewith, said machine being connected to a control for storing the machining program and generating the command signals to control the relative motion, the method comprising the steps of:

(a) storing scanning program instructions in association with the machining program to define a scanning cycle for using the sensing element to measure the actual position of the unmachined surfaces;

(b) executing the scanning cycle prior to executing the cycle of operation in response to the scanning program instructions to generate coordinate signals representing positions of detected points on the unmachined surfaces;

(c) storing selected ones of the coordinate signals; and

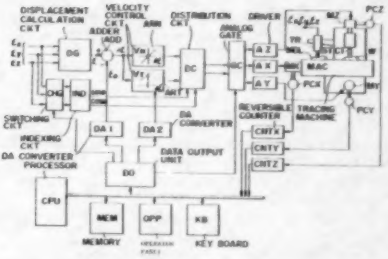
(d) executing the cycle of operation after completing the scanning cycle by generating modified command signals in response to the selected coordinate signals and the command signals derived from the machining program, said modified command signals effecting relative motion between the tool holder and the workpiece in accordance with the machining program and independent of variations in the position of the unmachined surfaces.

---

## 4,370,722
## TRACER CONTROL SYSTEM

**Ryoji Imazeki; Etsuo Yamazaki, and Takao Sasaki, all of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Jan. 5, 1981, Ser. No. 222,662**
**Claims priority, application Japan, Jan. 17, 1980, 55-3839**
**Int. Cl.³ G05B *19/37*; G06F *15/46***
**U.S. Cl. 364—474** **11 Claims**



1. A tracer control system in which the configuration of a model is detected by the motion of a tracer head with a stylus relative to the model surface being traced during a selected tracing, said system including a movable machine part moving along machine axes for providing said motion, and in which feed velocity components along said machine axes for providing the motion are obtained by arithmetic processing of data including displacement signals corresponding to the position of the end of said stylus with respect to the tracer head, said displacement signals having components corresponding to said machine axes, said motion of said tracer head selectively comprising sequential trace feed and pick feed steps, the tracer control system comprising:

a memory for storing data for determining the limits of the range of a selected tracing of the surface of the model;

a processor for reading out the stored data of the memory, for performing any necessary calculation of the limits of the range of the selected tracing from said stored data, and for performing control functions for performing said selected tracing over said range defined by said limits; and

detecting means for detecting the current position of said movable machine part along each said machine axis;

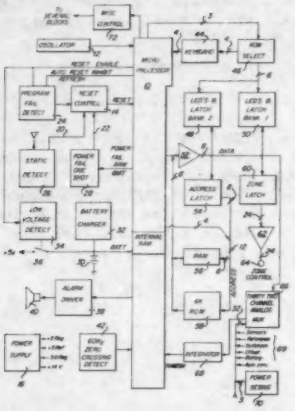
wherein each said limit of the selected tracing corresponding to a respective machine axis is compared with the current position along the respective machine axis, and when it is detected that the current position has reached a respective limit, during one of said trace feed steps, the trace feed step is switched to a pick feed step, and, after the pick feed step is performed for a respective predetermined distance, a predetermined subsequent trace feed step is performed, until said selected tracing is completed over said range.

4,370,723

## COMPUTERIZED ENERGY MANAGEMENT SYSTEM

Stanley S. Huffman, Golden; Alan F. Neel, Lakewood; Christopher A. Swartout, and Neil E. Dvorak, both of Denver, all of Colo., assignors to Peak Demand Limiters, Inc., Lakewood, Colo.

Filed Jan. 31, 1980, Ser. No. 117,381
Int. Cl.[3] G05B 15/00; G06F 15/20
U.S. Cl. 364—483 30 Claims



1. Power consumption controlling apparatus for use in a facility having a plurality of power consuming loads in various zones, including thermostatically controlled electrically operated space heating devices in some of the zones and electrically operated appliance devices in other of said zones, and comprising:

a power sensing circuit means associated with the main power line to the facility for continuously generating signals representative of total electrical power consumption by electrically operated devices in the facility;

a computer means connected to said power sensing circuit means for receiving said signals and comparing said signals with a predetermined maximum power demand limit set in said computer means;

keyboard means for entering data into the computer, said data including said predetermined maximum power demand limit and an initially selected maximum temperature level for each of a plurality of said electrically operated space heating devices;

an on-off heater control relay means connected to each of the electrically operated space heating devices for controlling the on-off state thereof;

temperature sensors, connected to the computer, for sensing temperature levels in each of the various zones so that said computer may compare each temperature level with a corresponding one of said initial selected maximum temperature levels to actuate said on-off heater control relay means when temperature levels are below said maximum temperature levels except when power consumption exceeds said power demand limit;

an on-off relay means connected to each of the plurality of the electrically operated appliance devices and turned on, to deliver power thereto or turned off by said computer;

a temperature level setting control means in the computer operably associated with each of the on-off heater control relays means for automatically incrementally increasing and decreasing the temperature level setting therefor;

said computer controlling said temperature control means to maintain said initial selected maximum temperature levels except when power consumption exceeds said power demand limit; and

said computer incrementally reducing said initial maximum temperature levels to a plurality of reduced temperature levels a preselected amount below said initial maximum temperature levels while power consumption exceeds said power demand limit.

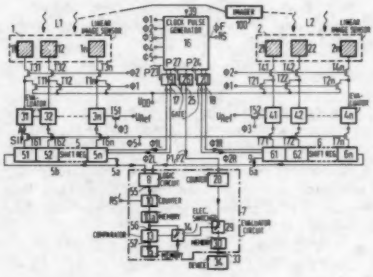
---

4,370,724

## CIRCUIT FOR THE SENSOR CONTROLLED DISTANCE MEASUREMENT

Heiner Herbst, Munich; Hans-Joerg Pfleiderer, Zorneding, and Hans-Peter Grassl, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 172,084
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1979, 2936535
Int. Cl.[3] G01C 3/08, 3/32; G06F 15/336
U.S. Cl. 364—561 14 Claims



1. A circuit for sensor controlled distance measurement, comprising: two linear image sensors each having sensor elements; means for projecting onto the sensor elements segments of lines corresponding to two images obtained separately from an object; evaluator means connected to the sensor elements for switching between two different switching states in dependence upon the exceeding of a reference charge in the sensor element so as to digitalize sensor signals; an evaluating circuit means for evaluating the digitalized sensor signals in dependence upon difference relative position displacements with respect to a maximum correlation; device means connected to the evaluating circuit means for indicating a range of said object; outputs of the evaluator means connected via transfer transistors in parallel to inputs of individual stages of two shift registers individually associated with the two image sensors, the last stage of each shift register having a output which is back coupled to an input of its first stage and also is connected with an input of the evaluating circuit means for a serial release of evaluated sensor signal; and clock pulse generator means for supplying clock pulse signals to control said evaluator means to digitalize the sensor signals, clock pulse signals to gates of said transfer transistors, and clock pulse signals to clock pulse inputs of said two shift registers for shifting information contained therein, said transfer transistors being operated by said clock pulse generator means in cooperation with said evaluator means and said shift registers in such a way so as to disconnect outputs of the evaluator means from the individual shift register stage inputs during digitalization of the sensor signals in the evaluator means, and to transfer the digitalized sensor signals in the evaluator means to said inputs of the individual shift register stages after digitalization.

**4,370,725**

## METHOD OF AND CIRCUIT ARRANGEMENT FOR AUTOMATIC SIGNAL-LEVEL CONTROL

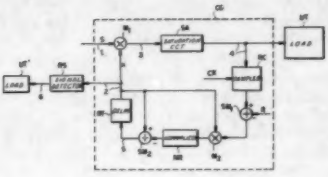
**Paolo Di Tria, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy**

**Filed Sep. 17, 1980, Ser. No. 188,036**

**Claims priority, application Italy, Sep. 18, 1979, 68828 A/79**

**Int. Cl.³ H04L** *15/24*

**U.S. Cl. 364—582** **8 Claims**



1. A method of controlling the level of an incoming signal, comprising the steps of:

(a) multiplying the incoming signal by a level-controlling modifier;

(b) differentially combining the thus-modified magnitude of said signal with a fixed reference value to produce an error signal;

(c) multiplying said error signal with said modifier and with a fractional coefficient to produce a corrective value;

(d) algebraically combining said modifier with said corrective value to produce an updated modifier; and

(e) repeating steps (a) through (d) with the updated modifier up to substantial disappearance of said error signal.

---

**4,370,726**

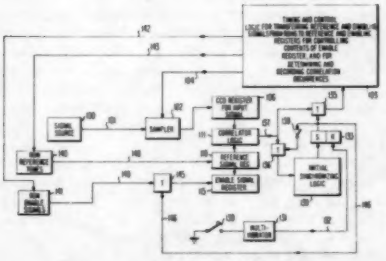
## SIGNAL CORRELATION MEANS EMPLOYING CHARGED-COUPLED DEVICE TYPE SHIFT REGISTERS

**Michael G. Caracappa, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jul. 25, 1980, Ser. No. 172,212**

**Int. Cl.³ G06F** *15/34*

**U.S. Cl. 364—604** **8 Claims**



1. A system for correlating the frequency of a quantized input signal with the frequency of a two level reference signal, comprising:

first and second signal summing means;

means for generating said two level reference signal and a two level enable signal;

first, second, and third registers for storing said quantized input signal, said two level reference signal, and said two level enable signal, respectively, and each having a plurality of corresponding stages;

logic means comprising a plurality of gating means each responsive to the contents of a given single corresponding stage of said second and third registers to gate the contents of said given stage of said first register to said first and second summing means, respectively, when the contents of said given stage of said second register is a first and second logic level, respectively, and the contents of said given stage of said third register is a first logic level, and to gate the contents of said given stage of said first register to neither summing means when the contents of said given stage of said third register is a second logic level; and

means for combining the contents of said first and second summing means to produce an output signal indicative of the degree of correlation between said quantized input signal and said two level reference signals.

---

**4,370,727**

## POCKET CALCULATOR FOR FAMILY PLANNING INCLUDING A THERMOMETRIC PROBE

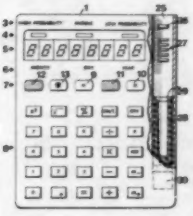
**Jean-Marie Bellet, Geneva, Switzerland, assignor to Bioself International Inc., Nassau, The Bahamas**

**Filed Jun. 4, 1980, Ser. No. 156,446**

**Claims priority, application Switzerland, Jun. 7, 1979, 5336/79**

**Int. Cl.³ G06F** *3/05, 15/42*

**U.S. Cl. 364—705** **16 Claims**



1. In a pocket calculator for family planning including a casing, a control keyboard, a display, electronic calculating and control means and a memory arranged for application of a family planning method, the improvement comprising: a receptacle in said casing for receiving a removable thermometric probe, said thermometric probe comprising a probe body ended by a thermometric sensor, a measuring and storing circuit connected to the sensor for providing and storing temperature information in the form of digital data corresponding to the temperature of the sensor, and output contact means for outputting said temperature information, the receptacle of the calculator including mating contact means, the receptacle contact means being coupled with the calculating and control means, the calculating and control means being arranged to read and store in the memory said digital data temperature information, there being no connection between the calculator and the probe when the probe is removed from the receptacle.

---

**4,370,728**

## STATIC STIMULUS TESTER FOR MICROPROCESSOR SYSTEMS

**James W. Coffron, Palo Alto, Calif., assignor to Creative Microprocessor Systems, Los Gatos, Calif.**

**Filed Jan. 14, 1980, Ser. No. 111,830**

**Int. Cl.³ G06F** *11/00, 11/20*

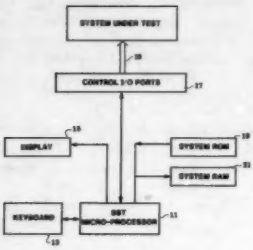
**U.S. Cl. 364—900** **5 Claims**

1. A static stimulus testing device for testing an electronic system from which has been removed a system digital electronic microprocessor which is normally included in said system, said device comprising:

a plurality of input-output ports corresponding to the input-/output pins of the system microprocessor of the system under test; and

control means for enabling a user to independently control the logic levels of each input/output port, so that when the testing device is connected to the system under test, in

place of said removed system microprocessor system, the user will have control of the logic levels of each input-/output line independent of the logic levels of the other lines of the system under test, which are normally controlled by said removed system microprocessor;




data entry means interconnected with said control means for entering into said device information to control said electronic system;

and display means interconnected with said control means for displaying from said device information about the state of said electronic system under test.

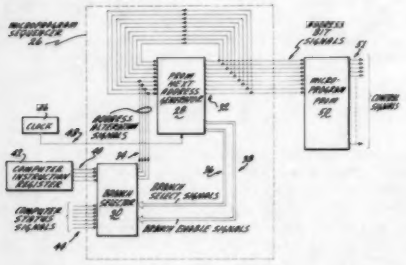
---

**4,370,729**

## MICROPROGRAM SEQUENCER

**Eugen I. Bosch, Tustin, Calif., assignor to Point 4 Data Corporation, Irvine, Calif.**

**Filed Mar. 21, 1980, Ser. No. 132,797**
**Int. Cl.[2] G06F 9/22**
**U.S. Cl. 364—200** **7 Claims**




1. A microprogram sequencer for generating in a proper sequence, including required branching, the addresses of the successive microinstructions used in executing a given machine instruction by a computer of the type in which status signals are produced which represent the status of various components of the computer, and in which the operation of the various components is synchronized by a clock which generates a periodic clock signal demarking successively occurring machine cycle clock periods, said microprogram sequencer comprising in combination:

address generator memory means for producing during a current machine cycle period a first set of output signals including a first code set of signals designating a normal next input address for said address generator memory means;

selector means receiving as inputs applied status signals, instruction signals, and predetermined ones of the set of output signals produced by said address generator memory means, and responsive to the received signals during the current machine cycle period for selectively producing address alteration signals during the current machine cycle period;

means for logically combining said address alteration signals and said first code set of signals designating a normal next address during the current machine cycle period to selectively alter the first code set of signals to represent an altered next input address, any alteration of the first code set of signals being established before the end of the current machine cycle period; and

means for applying the first code set of signals to said address generator memory means during the current machine cycle period as the input address thereto, said address generator memory means being responsive to such application of the first code set of signals, whether altered or unaltered, for producing during the next successive machine cycle period a selectively corresponding second set of output signals including a second code set of signals designating the next successive normal input address for said address generator memory means.

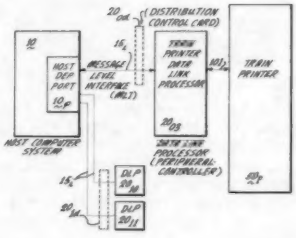
---

**4,370,730**

## RAM BUFFER MEMORY CIRCUIT SYSTEM FOR TRAIN PRINTER-DATA LINK PROCESSOR

**David P. Chadra, Anaheim, Calif., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed May 7, 1980, Ser. No. 147,509**
**Int. Cl.[3] G06F 3/12**
**U.S. Cl. 364—900** **10 Claims**




1. In a high speed data printer system wherein a host computer provides I/O descriptor command words and data link task-identifier words to a peripheral-controller which operates a train-printer mechanism, and said peripheral-controller provides result/descriptor words to inform said host computer as to the completion/incompletion of each commanded task, a buffer memory circuit system in said peripheral-controller comprising:

(A) a RAM buffer memory which includes:

(a1) a first dedicated memory area (print image buffer) having a plurality of addressable locations which are numerically equal to the number of columns printable by said train printer mechanism, each of said locations storing character data to be printed and which had been received from said main host computer;

(a2) a second dedicated memory area (train image buffer) having a plurality of addressable locations for storing coded data representing each of a plurality of graphic characters that match the characters on the train of said train-printer mechanism;

(B) pointer address means for pointing to addresses in said second memory area (train image buffer) in synchronism with the movement of characters in said train wherein each address pointed-to represents a character positioned over a print hammer;

(C) means to scan the character data in said first memory area (print image buffer) wherein each of said character data corresponds to a specific hammer position in said print mechanism;

(D) comparison means for comparing the addressed code in

said second memory area (train image buffer) with said addressed code in said first memory area (print image buffer) wherein a match in coding will initiate the firing of a print hammer during a print cycle.

---

**4,370,731**

## SYSTEM FOR ENTERING TEMPERATURE CONTROL DATA AND DISPLAYING IT WITH THE TEMPERATURE SCALE

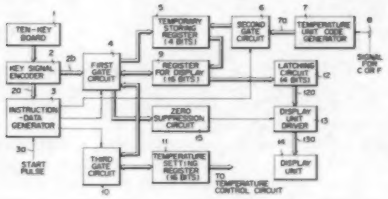
**Masayuki Sasaki, Kawasaki; Yoshio Oida, Funabashi, and Hidetoshi Semi, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 928,977, Jul. 28, 1978, abandoned. This application May 8, 1980, Ser. No. 148,036**

**Claims priority, application Japan, Jul. 30, 1977, 52-91614**

**Int. Cl.³ G06F *15/20*; H05B *1/02***

**U.S. Cl. 364—900** **9 Claims**




1. A system for selectively setting a numerical temperature level and for displaying a temperature setting comprising the selected temperature level and an alphabetic temperature unit data indicating the temperature scale associated with said selected temperature level, wherein said temperature scale is in degrees Celsius or degrees Fahrenheit, said system comprising:

temperature data input means for entering the temperature level to be set and displayed;

temperature unit code generator means for entering the temperature scale associated with said temperature level;

memory means for combining a said temperature level entered by said temperature data input means with a said temperature scale entered by said temperature unit code generator means to form a said temperature setting and for storing said temperature-setting;

temperature-setting register means for storing a said temperature level;

first gate circuit means coupled to said temperature data input means and said memory means for transferring a said temperature level from said temperature data input means to said memory means;

second gate circuit means coupled to said temperature unit code generator means and said memory means for transferring a said temperature scale from said temperature unit code generator means to said memory means;

third gate circuit means coupled to said first gate circuit means and said temperature-setting register means for transferring temperature levels between said temperature setting register means and said memory means through said first gate circuit means and said third gate circuit means;

display means coupled to said memory means for displaying said temperature setting including said temperature level and said temperature scale stored in said memory means; and

instruction data generator means coupled to said temperature data input means, said first gate circuit means, said second gate circuit means and said third gate circuit means for controlling (a) the transfer of a temperature level from said temperature data input means to said memory means via said first gate circuit means, (b) the transfer of a said temperature scale from said temperature unit code generator means to said memory means via said second gate circuit means, and (c) the transfer of a said temperature level between said temperature setting register means and said memory means via said first gate circuit means and said third gate circuit means to combine in said memory means a temperature level entered through said temperature data input means and a temperature scale entered through said temperature unit code generating means into a temperature setting in said memory means for display by said display means.

---

**4,370,732**

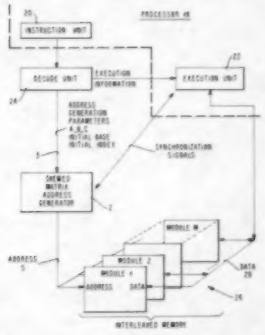
## SKEWED MATRIX ADDRESS GENERATOR

**Peter M. Kogge, Endicott, N.Y., assignor to IBM Corporation, Armonk, N.Y.**

**Filed Sep. 15, 1980, Ser. No. 187,256**

**Int. Cl.³ G06F *9/34***

**U.S. Cl. 364—900** **2 Claims**




1. In an address generator for an M-interleaved memory for accessing at the memory system's maximum access rate successive elements of either a row or a column of a matrix stored in a skewed matrix pattern, apparatus for generating the sequences of appropriate memory addresses for the desired row or column, comprising:

a base register having an input connected to a first adder which adds an input value A to the contents in the base register so that the output of the adder can be stored and subsequently used as a pointer to the beginning of the current row in the matrix in memory being accessed;

an index register having an input connected to a second added for adding an input value B to the contents of the index register and that sum being conditionally added in a third adder to an input value C which sum is then stored in the index register so that it can be subsequently used as a pointer to the column element in the matrix in memory being accessed;

a fourth adder having inputs connected to the base register and the index register for generating from the row and column pointers the actual memory address of the next matrix element to be accessed;

whereby in response to a series of clock pulses a sequence of memory addresses needed to access the desired row or column will be generated with the result appearing in natural order.

---

**4,370,733**

## PATTERN GENERATION SYSTEM

**John J. Gaudio, P.O. Box 27826, Denver, Colo. 80227**

**Division of Ser. No. 907,685, May 19, 1978, Pat. No. 4,262,338. This application Nov. 10, 1980, Ser. No. 205,790**

**Int. Cl.³ G06F *3/14***

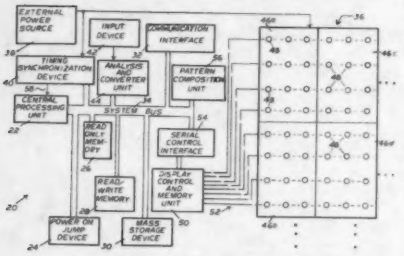
**U.S. Cl. 364—900** **4 Claims**

1. A computer system comprising a central processing means for operatively controlling said computer system, and

memory means having a plurality of addressable memory locations for recording and holding signals therein, said processing means operatively addressing said addressable memory locations and controlling said memory means to record signals in the memory locations addressed and to supply signals in accordance with the signals previously recorded in the memory locations addressed, said computer system further comprising, in combination:

means (56) for combining a plurality of pre-existing signals and supplying a new signal formed by the combination of the pre-existing signals, said combining means being operatively connected with said processing means and with said memory means and being operatively controlled by said processing means, said combining means further comprising:

logical combination means (154) for performing a selected logical combination on two input signals applied thereto and for supplying therefrom a new signal representative of the logical combination of the two applied input signals,




said logical combination means being operatively connected to receive one input signal from said memory means;

temporary result storage means (160) operatively connected to receive the new signal supplied from said logical combination means, said temporary result storage means also supplying the new signal received as an output signal at an output thereof, the output of said temporary result storage means being operatively connected to supply the output signals therefrom as the other one of the two input signals to said logical combination means;

addressing means (148) operatively connected for addressing selected memory locations of said memory means; and

delivery means (164) operatively controlled by said addressing means for conducting the new signal from the output of said temporary result storage means to a selected memory address location addressed by said addressing means.

---

**4,370,734**

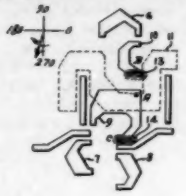
## SWITCHING METHOD FOR EFFECTING REPLICATION IN MAGNETIC BUBBLE DEVICES

**Isoris S. Gergis, Yorba Linda, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Apr. 13, 1981, Ser. No. 253,454**
**Int. Cl.³ G11C *19/08***
**U.S. Cl. 365—12** **1 Claim**

1. The method of effecting replication in a magnetic bubble domain propagation structure having an organization of propagate elements providing a major loop, at least one organization of propagate elements providing a minor loop wherein magnetic bubbles propagate in response to the influence of a clockwise rotating magnetic field, a magnetic field, a magnetic bubble switch propagate element associated with each minor loop for transmitting magnetic bubbles into said major loop, a control conductor element associated with each minor loop traversing each said minor loop, its associated magnetic bubble switch propagate element and a proximate propagate element of said major loop, and a current pulse source for delivering current pulses to said control conductor element, said method comprising the steps of:

applying a first current pulse to said control conductor element at approximately 45° phase angle of said rotating magnetic field, said current pulse having a magnitude and polarity adapted to attract a magnetic bubble to said bubble switch propagate element and stretch said magnetic




bubble between said bubble switch propagate element and its proximate minor loop propagate element,

terminating said first current pulse at approximately 0° phase angle of said rotating magnetic field, and

applying a second, narrow, current pulse of the same polarity as said first current pulse to said control conductor element at approximately 270° phase angle of said rotating magnetic field, said second current pulse having an amplitude sufficient to sever said magnetic bubble.

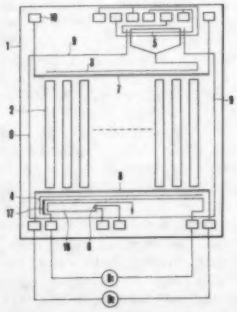
---

**4,370,735**

## MAGNETIC BUBBLE MEMORY DEVICE

**Toshio Futami, and Kazutoshi Yoshida, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 29, 1980, Ser. No. 191,503**
**Int. Cl.³ G11C *19/08***
**U.S. Cl. 365—16** **4 Claims**




1. A magnetic bubble memory device comprising;

a magnetic bubble generator which generates a magnetic bubble carrying information "1" by conducting a pulse current on its hairpin-shaped conductor loop and creating a data having information "0" by suppressing said pulse current;

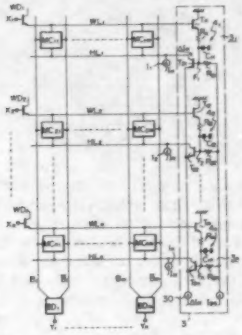
a major propagation circuit for propagating said magnetic bubble to a transfer-in gate circuit which transfers said magnetic bubble to a memory storage region; and

a gate means provided between said magnetic bubble generator and said major propagation circuit for transferring a magnetic bubble carrying information "1" at a predetermined timing and preventing spurious bubbles from being transferred to said major propagation circuit at a second predetermined timing.

## 4,370,736
## TERMINATION CIRCUIT FOR WORD LINES OF A SEMICONDUCTOR MEMORY DEVICE

Yukio Takahashi, Shiga, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 29, 1980, Ser. No. 182,670
Claims priority, application Japan, Aug. 30, 1979, 54-110720
Int. Cl.³ G11C *11/40, 7/00*
U.S. Cl. 365—155 10 Claims



1. A termination circuit, for word lines of a semiconductor memory device having a plurality of memory cells, operatively connected between the word lines and hold lines, the word lines selected by word address signals applied to the semiconductor memory device, the word lines driven to different first or second potential levels with respect to a reference voltage in dependence upon the selected or non-selected condition of the word lines, each hold line having a hold line current source operatively connected thereto, comprising:

first transistors, each operatively connected to one of the word lines, each detecting a potential change of one of the word lines with respect to the reference voltage, and each generating a detected output signal when a change in the word line potential with respect to the reference voltage occurs;

delay circuits, each operatively connected to one of said first transistors, respectively, for delaying the detected output signal of the one of said first transistors to which the selected word line is connected for a predetermined period and for generating a delayed detected output signal;

second transistors, each having an emitter, a base operatively connected to one of said delay circuits, respectively, and a collector operatively connected to one of the hold lines, respectively, and each turned on and off by the delayed detected output signal from one of said delay circuits, respectively; and

a common hold current source for the hold lines, operatively connected to the emitter of said second transistors, and each of said second transistors and said common hold current source forming a current switch.

---

## 4,370,737
## SENSE AMPLIFIER AND SENSING METHODS

John Y. Chan, Belmont, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Feb. 11, 1980, Ser. No. 120,426
Int. Cl.³ G11C *11/24*
U.S. Cl. 365—203 23 Claims

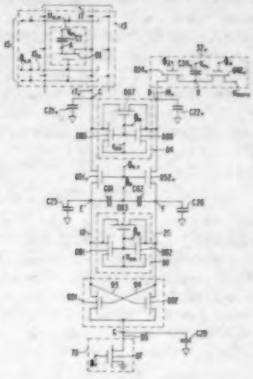
1. An electronic circuit for determining the logic state of a memory cell existing selectively either in a low logic state or in a high logic state, the electronic circuit comprising:

means for establishing a voltage difference between (1) a first input conductor coupled to the memory cell and (2) a first reference conductor, the sign of the voltage difference being indicative of the logic state;

means for transferring the voltage on said first input conductor to a second input conductor and the voltage on said first reference conductor to a second reference conductor;

means for selectively at least partially isolating said input conductors from each other and said reference conductors from each other.

means for increasing the voltage on said second input conductor and on said second reference conductor after said input and reference conductors are isolated from each other;



means for amplifying the voltage difference to generate an amplified voltage difference between the voltages on (1) said second input conductor coupled to said first input conductor and (2) said second reference conductor coupled to said first reference conductor; and

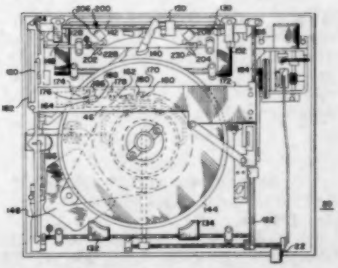
means for sensing the amplified voltage difference to determine the logic state.

---

## 4,370,738
## VIDEO DISC PLAYER HAVING RECORD RETAINING MECHANISM

Clyde F. Coleman, Crawfordsville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 21, 1980, Ser. No. 210,464
Int. Cl.³ G11B *25/04, 17/04*
U.S. Cl. 369—77 8 Claims



1. In a player for recovering prerecorded information from a turntable-supported record during playback; said record being enclosed in a cover having an edge opening in communication with a record enclosing cavity; said player having an input slot through which an occupied cover is inserted along a

path to load an enclosed record therein; said player including a record extracting mechanism for removing said enclosed record from said cover during cover withdrawal subsequent to an occupied cover arrival at a fully inserted position in said player, thereby retaining said record in said player resting on a record supporting platform; an empty cover being inserted into said player along said path for retrieving said retained record into said cover; apparatus comprising:

(A) a first member mounted in said player; the location of said first member being such that a peripheral portion of said retained record is urged forward into engagement with said first member by an empty cover, as said empty cover is inserted into said player for record retrieval, to hold said record in place during said cover insertion; and

(B) means for retracting said first member out of said cover insertion path just prior to any engagement between said cover and said first member, as said empty cover is inserted into said player, to allow further insertion of said cover into said player.

---

**4,370,739**

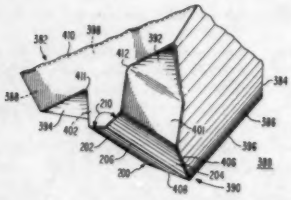
**SPINEL VIDEO DISC PLAYBACK STYLUS**

**Chih C. Wang, Hightstown; Harry L. Pinch, Princeton, and Ronald F. Bates, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Jun. 9, 1980, Ser. No. 158,062**

**Int. Cl.³ G11B** *9/06, 3/44*

**U.S. Cl. 369—126** **4 Claims**



1. In an information storage and playback system comprising a playback stylus and a disc record wherein information is recorded in the surface of the disc record; wherein the stylus is fabricated out of a dielectric support material; wherein there is relative motion between the disc and the playback stylus during recovery of the recorded information; and wherein the stylus contacts the record disc surface during the recovery of the information;

the improvement wherein said stylus dielectric support material is single crystal magnesium aluminate spinel comprised of a ratio of MgO to $Al_2O_3$ of about 1:1 to about 1:2.5 and having a surface with a (100) orientation, and further comprising a conductive layer of epitaxial α-tantulum having a surface with a (110) orientation formed on said spinel (100) surface.

---

**4,370,740**

**ROTARY RECORDING MEDIUM**

**Atsumi Hirata, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Dec. 11, 1979, Ser. No. 102,528**

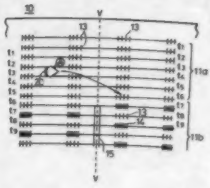
**Claims priority, application Japan, Dec. 11, 1978, 53-152926**

**Int. Cl.³ G11B** *11/00*

**U.S. Cl. 369—276** **6 Claims**

1. A grooveless rotary recording medium, at least one surface of which has a spiral main track comprising a multiplicity of successively adjacent track turns, each of said turns being identified by a respective track turn number, and a reference signal track disposed centrally between the center lines of mutually adjacent track turns of the main track, said surface comprising:

at least one displacement part comprising a plurality of track turns of the main track having no information signal recorded thereon, only either one of first and second reference signals being recorded in reference signal tracks along both of the opposite sides of each main track; and



at least one information part comprising track turns of the main track having an information signal recorded thereon, the first and second reference signals being recorded alternately in the reference signal tracks on opposite sides of the main track, and a third reference signal being recorded at positions where the track turn numbers change at every revolution of the recording medium.

---

**4,370,741**

**PROCESS AND AN APPARATUS FOR TRANSMITTING DATA ACROSS A TWO-WIRE LINE**

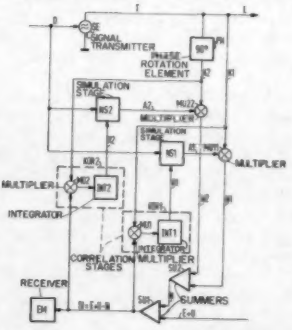
**Adolf Haass, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Apr. 9, 1980, Ser. No. 138,707**

**Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921780**

**Int. Cl.³ H04B** *3/20*

**U.S. Cl. 370—24** **21 Claims**



1. A process for transmitting data over a two-wire line from a first station to a remote, second station and vice-versa, wherein the data of the first station produce a cross-talk signal comprising first and second signal components, which cross talk signal is superimposed upon a received signal which comprises a cross-talk superposed data modulated carrier transmitted from the remote, second station and occurs in the received signal at the first station, comprising the steps of:

transmitting the data with a data modulated carrier over the two-wire line;

branching the modulated carrier into first and second orthogonal signal components whose phase angles differ by 90°;

correlating a difference signal with the first and second orthogonal signal components, respectively, to produce a

first regulating signal indicating the deviation of the first orthogonal signal component from the first signal component of the cross-talk signal and a second regulating signal indicating the deviation of the second orthogonal signal component from the second signal component of the cross-talk signal;

producing first and second dummy signals from the first and second regulating signals and the data, respectively;

multiplying the first orthogonal signal component and the first dummy signal, and the second orthogonal signal component and the second dummy signal to produce first and second multiplicative signals;

summing the first and second multiplicative signals to produce a compensation signal; and

summing the cross-talk superposed data modulated carrier and the compensation signal to produce the difference signal.

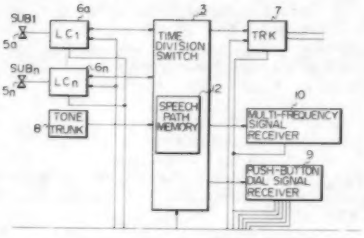
---

**4,370,742**

## TIME DIVISION ELECTRONIC SWITCHING SYSTEM

**Eiji Minamitani, Yokohama; Kiyoo Ozawa, Kawasaki, and Takashi Yokoto, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Sep. 15, 1980, Ser. No. 187,420**
**Claims priority, application Japan, Sep. 20, 1979, 54/121423**
**Int. Cl.³ H04J *3/00*; H04Q *11/04***
**U.S. Cl. 370—58** **7 Claims**




**1**. A time division electronic switching system operatively connected to subscriber connection equipment and other telephone office connection equipment, the subscriber and other telephone office connection equipment generating dial information, including, as structural elements, a signal processor operatively connected to a central processing unit, a multi-frequency signal receiver operatively connected to both the signal processor and a time division switch including a speech path memory having transmitting and receiving sides, wherein said signal processor generates a control signal, said system comprising:

a multi-frequency signal receiver circuit of the multi-frequency receiver, having an output, including dial information detection means for detecting the dial information and for generating detected dial information;

holding memory means, operatively connected to the speech path memory, for controlling the writing of the detected dial information from said multi-frequency signal receiver circuit into the speech path memory; and

access means, operatively connected between the speech path memory means and the signal processor, for controllably reading out the detected dial information written in the speech path memory and supplying the detected dial information to the signal processor in dependence upon the control signal, whereby the signal processor supplies the detected dial information to the central processing unit.

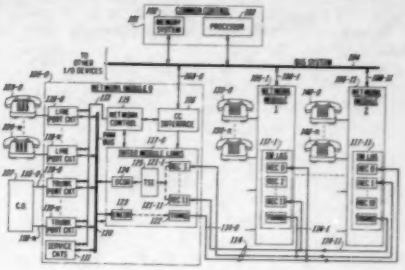
---

**4,370,743**

## TIME DIVISION SWITCHING SYSTEM

**John C. Moran, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jul. 25, 1980, Ser. No. 172,191**
**Int. Cl.³ H04Q *11/04***
**U.S. Cl. 370—67** **17 Claims**




**13**. The method of serving calls between port circuits in different modules of a time division switching system in which each module has a plurality of port circuits connected to a time division bus,

a bus system interconnecting all of said modules for the serving of intermodule calls,

said method comprising the steps of:

(1) exchanging call data words containing call message information over said bus system between a first and a second one of said modules serving an intermodule call,

(2) temporarily registering in a module each word received by said module over said bus system,

(3) entering said message information of a registered word into a buffer memory of a module only when said registered word pertains to an intermodule call currently being served by said module,

(4) repetitively scanning said buffer memory of each module to read out any call message information stored in said buffer memory, and

(5) applying said readout call message information to the time division bus of the module containing said readout memory.

---

**4,370,744**

## TIME DIVISION MULTIPLEX COMMUNICATION SYSTEM

**Junzo Hirano, Zushi, and Yukio Inoue, Yokohama, both of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Japan**

**Filed Feb. 28, 1980, Ser. No. 125,813**
**Claims priority, application Japan, Mar. 2, 1979, 54-24180**
**Int. Cl.³ H04J *3/02***
**U.S. Cl. 370—88** **21 Claims**

**1**. A time division multiplex communication system comprising:

a set of loop shaped transmission line pairs for transmitting time division multiplexed signals via a first transmission line pair in a first loop direction and via a second transmission line pair in the opposite loop direction;

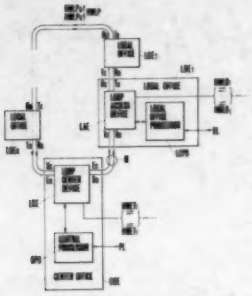
a central office connected to starting ends and terminal ends of each said transmission line pair;

and a plurality of local offices located at intermediate points of each said transmission line pair;

said central office including means connected to the starting and terminal ends of said transmission line pair for transmitting and receiving signals therewith, and a processing means for assigning time slots of time division multiplexed channels of said transmission line pairs to data signals to be

sent via the transmission line pairs and for sending an interoffice signal regarding said assignment of the time slots to said local offices;

each of said local offices including access means for accessing the assigned time slots of said time division multiplexed channels of said transmission line pairs, and control means responsive to said interoffice signal sent from said central office for controlling said access means, whereby when a communication is made between two offices belonging to said loop, said processing means of the central



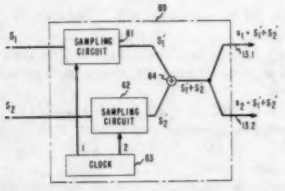
office assigns a time slot to said offices between which said communication is made for causing the access means of said local offices to operate under control of said control means of the local office so as to form with said assigned time slots two route channels, one passing through a specific point on a transmission path provided by said transmission line pairs, while the other not passing through said specific point thereby performing interoffice communications through either one of said route channels under the control of either one of said processing means of the central office and said control means of the local office.

---

## 4,370,745
## FAIL-SAFE TRANSMISSION SYSTEM

**Stewart E. Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 14, 1980, Ser. No. 206,720**
**Int. Cl.³ G06F *11/08*; H03K *13/32***
**U.S. Cl. 371—8** **7 Claims**



**1.** A fail-safe system for transmitting a multiplicity of n input signals over an equal multiplicity of n transmission links comprising:

means for encoding said input signals into n encoded signals such that at least two of said n encoded signals contain sufficient information to permit recovery of each of said input signals from each of said at least two encoded signals;

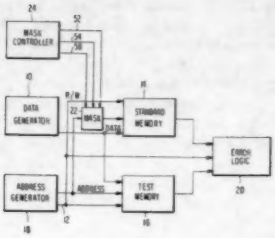
each of said encoded signals being transmitted along a different one of said multiplicity of transmission links;

and a decoder at the output end of said links for recovering said input signals.

## 4,370,746
## MEMORY ADDRESS SELECTOR

**Robert E. Jones, Fishkill, and Donald H. Wood, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 24, 1980, Ser. No. 219,656**
**Int. Cl.³ G01R *31/28*; G11C *29/00***
**U.S. Cl. 371—27** **9 Claims**



**1.** In a testing apparatus of the type including a standard device for providing an output in response to N address signals received on N address input lines, a test device for providing an output in response to address signals received on a plurality of address lines, an address generator for providing address signals to said standard and test devices, and means for comparing the outputs from said two devices, the improvement comprising:

said address generating means providing M address signals on M address output lines, $M \geqq N$; and

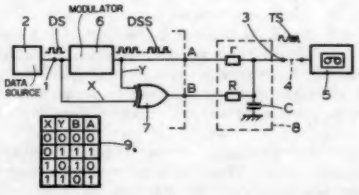
programmable masking means for selecting N of said M address signals to be supplied as the N address signals to said standard device.

---

## 4,370,747
## DATA TRANSMISSION

**Richard E. F. Bugg, Shirley, and Derek J. Parkyn, Sevenoaks, both of England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 15, 1980, Ser. No. 216,234**
**Claims priority, application United Kingdom, Dec. 21, 1979, 7944027**
**Int. Cl.³ H03C *3/04***
**U.S. Cl. 375—62** **8 Claims**



**1.** A circuit arrangement for use in a data transmission system in which binary data elements are trasmitted by frequency shift using two tone frequencies f0 and f1 corresponding to the transmission of data elements '0' and '1', respectively, said circuit arrangement being operable to generate two such tone frequencies f0 and f1 in response to a data signal consisting of the binary data elements, said circuit arrangement comprising; modulator means responsive to the data signal to produce a digital signal having a predetermined pattern of binary '1' and binary '0' values, the pattern occurring for the duration of each data element '0' in the applied data signal at a first bit rate and occurring for the duration of each data element '1' at a second

bit rate, said first and second bit rates being appropriate for the generation of the respective tone frequencies f0 and f1; integrator means responsive to the digital signal to produce by decoding of the digital signal an output signal which conforms to the tone frequency f0 when the digital signal has said predetermined pattern occurring at said first bit rate and to the tone frequency f1 when the digital signal has said predetermined pattern occurring at said second bit rate; and control means responsive to the data signal to effect an adaptive control of the amplitude of the output signal by controlling the input to said integrator means such that this amplitude tends towards the same level for each of the two tone frequencies f0 and f1.

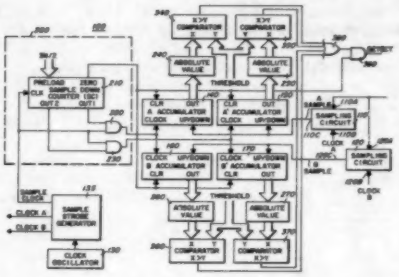
---

**4,370,748**

## APPARATUS AND METHOD FOR DETECTING THE PRESENCE OF A PULSED RADIO FREQUENCY SIGNAL

**Robert V. Janc, Palos Heights; David S. Robins, Buffalo Grove, and Michael H. Retzer, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jan. 5, 1981, Ser. No. 222,423**
**Int. Cl.³ H04L *27/06***
**U.S. Cl. 375—94** **6 Claims**



1. Apparatus for detecting the presence of a pulsed radio frequency signal including:

sampling means for sampling said radio frequency signal during selected periods of time having duration T, to periodically generate first and second samples in quadrature relationship;

first and second accumulating means, coupled to said sampling means, for respectively accumulating said first and second samples during a first period of time less than T to respectively generate first and second sums;

third and fourth accumulating means, coupled to said sampling means, for respectively accumulating said first and second samples during a second period of time less than T to respectively generate third and fourth sums, said second period of time overlapping said first period of time, and

comparator means, coupled to said first, second, third and fourth accumulating means, for generating an output signal when any one of said first, second, third and fourth sums exceeds a predetermined threshold level.

---

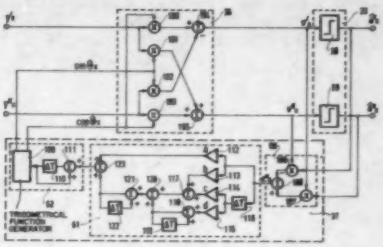
**4,370,749**

## PHASE NOISE CORRECTION CIRCUIT FOR A DATA TRANSMISSION SYSTEM

**Michel Levy, Massy, and Christian Poinas, Boulogne, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France**

**Filed Oct. 17, 1980, Ser. No. 198,086**
**Claims priority, application France, Oct. 19, 1979, 79 26065**
**Int. Cl.³ H04B *15/00***
**U.S. Cl. 375—99** **5 Claims**

1. A phase noise correction circuit for a synchronous data transmission system using symbols and including a decision circuit at its receiving end for supplying an estimate of the transmitted symbols on the basis of the received symbols, wherein said correction circuit comprises a phase shifter circuit located at the receiving end, an output of the phase shifter



circuit being coupled to an input of the decision circuit, and a third-order phase-controlling feedback circuit connected in a feedback path between the decision circuit and the phase shifter circuit.

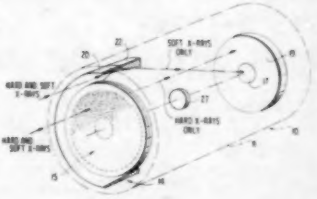
---

**4,370,750**

## EXTENDED RANGE X-RAY TELESCOPE

**Richard B. Hoover, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed May 15, 1981, Ser. No. 263,828**
**Int. Cl.³ G02B *23/06*; H05G *1/00***
**U.S. Cl. 378—43** **21 Claims**



1. An extended range X-ray telescope system comprising:

(a) a tubular mount having a collecting region at one axial end for receiving X-rays from a remote source, and a detector region separated from the collecting region;

(b) a first subsystem associated with the collecting region for directing only relatively soft, near on-axis X-rays incident on a first portion of the collecting region into a first detector located at the detector region and sensitive to relatively soft X-rays; and

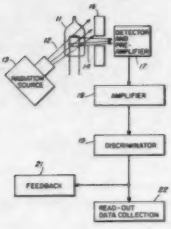
(c) a second subsystem associated with the collecting region for directing only relatively hard near on-axis incident on a second portion of the collecting region into a second detector located at the detector region and sensitive to relatively hard X-rays.

## 4,370,751

## METHOD OF NON-DESTRUCTIVELY MEASURING THE PRESSURE OF A GAS IN A CLOSED VESSEL

**Francis X. Pink, Norwood; Carmine Persiani, Milford, and Paul Lublin, Framingham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Jan. 9, 1981, Ser. No. 223,874**
**Int. Cl.³ G01N *23/22***
**U.S. Cl. 378—47** **7 Claims**




1. A method of non-destructively measuring the pressure of a gas in a closed vessel comprising

irradiating said closed vessel with x-rays;

detecting secondary radiation emitted by irradiated gas within and emerging from said closed vessel;

discriminating the detected secondary radiation with respect to a particular element to provide an intensity count; and

converting said count to a pressure reading.

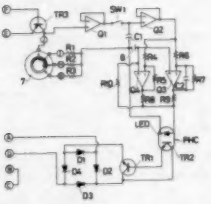
---

## 4,370,752

## DEVICE FOR STABILIZING TUBE CURRENT IN X-RAY PHOTOGRAPHING APPARATUS

**Shuhei Furuichi, Kyoto, and Masakazu Suzuki, Naka, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan**

**Continuation of Ser. No. 54,691, Jul. 5, 1979, abandoned. This application Nov. 10, 1981, Ser. No. 319,925**
**Claims priority, application Japan, Jul. 7, 1978, 53/83215**
**Int. Cl.³ H05G *1/30***
**U.S. Cl. 378—110** **1 Claim**




1. In an X-ray photographing apparatus of the type including an X-ray tube and a high voltage and filament transformer coupled respectively to the anode and filament of said X-ray tube, X-ray tube current stabilizing means comprising:

a means for detecting a tube current of said X-ray tube;

a means for setting a reference tube current level;

a comparing means for comparing said detected tube current with said reference tube current and for producing an output proportionate to said comparison, said comparing means comprising:

an integration circuit comprising a first amplifier with an integrating capacitor thereacross, said first amplifier having said detected tube current applied to one input and said reference tube current applied to another input thereof; and

a second amplifier coupled in parallel with said integration circuit, said second amplifier having said detected tube current applied to one input and said reference tube current applied to another input, said second amplifier further having an output thereof coupled to an output of said first amplifier and forming an output of said comparing means; and

a means for controlling said tube current on a primary side of said filament current transformer in response to said output of said comparing means such that said tube current is brought into agreement with said reference tube current.

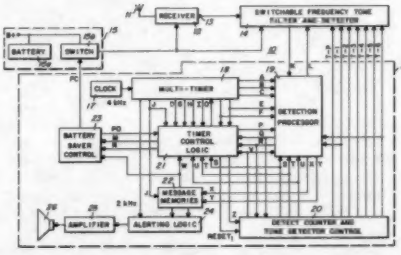
---

## 4,370,753

## BATTERY SAVER FOR A TONE CODED SIGNALLING SYSTEM

**Edward L. Ehmke, Margate, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Division of Ser. No. 755,696, Dec. 30, 1976, Pat. No. 4,181,893, which is a continuation of Ser. No. 590,537, Jun. 26, 1975, abandoned. This application May 29, 1979, Ser. No. 42,755**
**The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.**
**Int. Cl.³ H04B *5/04***
**U.S. Cl. 455—36** **26 Claims**




1. A multiple alert receiver operable in response to receiving a predetermined tone code, said receiver comprising:

receiver means for receiving transmitted signals;

detector means coupled to said receiver means for indicating a detection in response to said predetermined code being received by said receiver means; and

alert means coupled to said receiver means and said detector means for selecting and generating at least one of several alert signals in response to said detector means indicating a code detection and an additional signal being received by said receiver means, the additional received signal determining which of said several alert signals will be generated;

wherein the predetermined code includes at least one tone and said detector means includes circuitry for searching for said tone within a first time window duration and wherein said alert means includes circuitry for searching for said additional signal within a second time window duration, occurring after the code detection, which is greater than said first time window duration, whereby the receiver will be more likely to select a correct alert signal after said predetermined code has been identified.

# DESIGNS

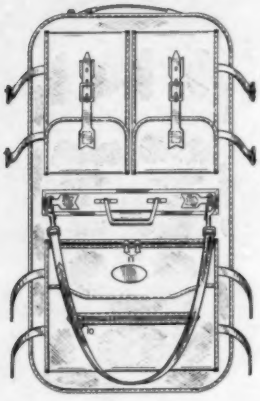
## JANUARY 25, 1983

267,674
HOCKEY PANTS
John Livernois, St. Jean, Canada, assignor to Canada Cycle and Motor Company Limited, Weston, Canada
Filed Oct. 21, 1980, Ser. No. 198,906
Claims priority, application Canada, Apr. 25, 1980, 2504807
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

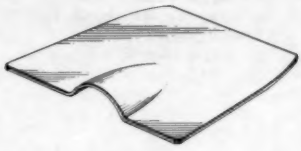
267,675
OVERSHOE
James H. Allen, Covington, Ky., assignor to 'Totes', Incorporated, Loveland, Ohio
Filed Sep. 8, 1980, Ser. No. 184,984
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—271

267,676
OVERSHOE
James H. Allen, Covington, Ky., assignor to 'Totes', Incorporated, Loveland, Ohio
Filed Sep. 8, 1980, Ser. No. 184,985
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—271

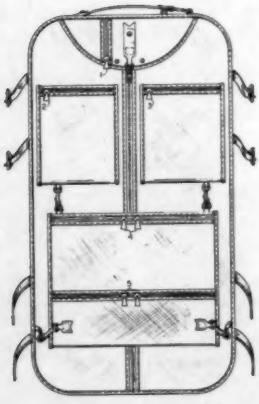
267,677
GARMENT BAG
Joseph Y. Pelavin, North Bergen, N.J., assignor to CPG Products Corp., Minneapolis, Minn.
Filed Jun. 30, 1980, Ser. No. 164,107
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



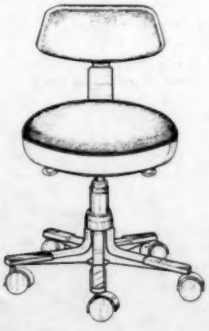
267,678
BABY SEAT
John J. Breen, 7100 Alcove Ave., North Hollywood, Calif. 91605
Filed Nov. 3, 1980, Ser. No. 203,521
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—7



267,679
GROUND INSERTED HOLDER FOR ROASTING FORK OR THE LIKE
Ray H. Barney, 217 Bond St., Allegan, Mich. 49010
Filed May 27, 1980, Ser. No. 153,371
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20



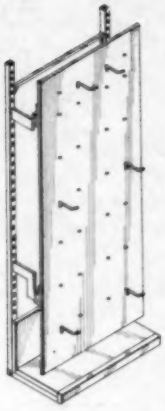
267,680
CHAIR
Dennis F. Leffler, Charlotte, and Danny M. Truette, Pineville, both of N.C., assignors to The Pelton and Crane Company, Charlotte, N.C.
Filed Mar. 3, 1980, Ser. No. 126,794
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30



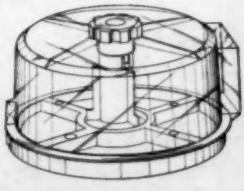
267,681
CHAIR
Wolfgang Müller-Deisig, Borgenteich, Fed. Rep. of Germany, assignor to Fehlbaum & Co., Dornach, Switzerland
Filed Jan. 14, 1981, Ser. No. 224,863
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

267,682
DISPLAY UNIT
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jan. 7, 1981, Ser. No. 223,179
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85

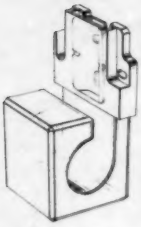
267,683
DISPLAY UNIT
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jan. 7, 1981, Ser. No. 223,181
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85



267,684
COMBINED TOILET PAPER HOLDER AND DISPENSER
Lars B. Lander, Zug, Switzerland, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed May 4, 1981, Ser. No. 263,477
Term of patent 14 years
Int. Cl. D23—*02*; D7—*01*
U.S. Cl. D6—97

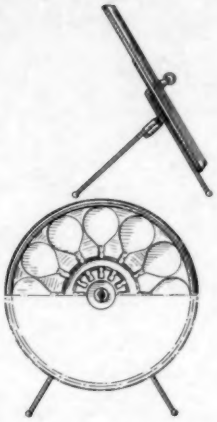


267,685
WALL HOOK
Guy Vrignaud, Grenoble, France, assignor to Allibert S.A., Grenoble, France
Filed Feb. 4, 1981, Ser. No. 231,347
Claims priority, application Hague, Aug. 18, 1980, DM/000 313
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—120

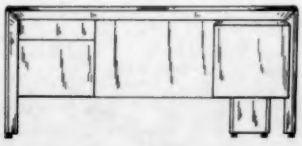


267,686
WALL MOUNTED FLAG CASE
Donald R. Dawson, 116 E. Edgebrook, Apt. 614, Houston, Tex. 77504
Filed Oct. 3, 1980, Ser. No. 193,734
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—127

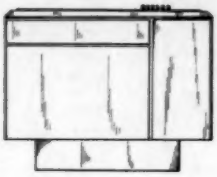
267,687
LENS DISPLAY STAND
Milton B. Savage, deceased, late of Brooklyn, N.Y.; Sara Savage, executor, and Bernard D. Kane, executor
Filed Feb. 19, 1980, Ser. No. 122,360
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—157



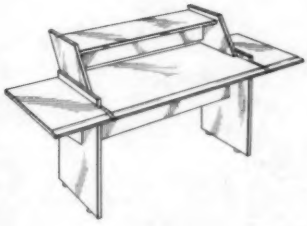
267,688
DESK OR SIMILAR ARTICLE
Warren Platner, Guilford, Conn., assignor to Litton Business Systems, Inc., Burlington, Iowa
Division of Ser. No. 914,285, Jun. 9, 1978. This application Jan. 9, 1981, Ser. No. 223,682
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—162



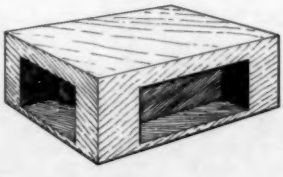
267,689
COMMUNICATION CABINET
Warren Platner, Guilford, Conn., assignor to Litton Business Systems, Inc., Burlington, Iowa
Division of Ser. No. 914,285, Jun. 9, 1978. This application Jan. 9, 1981, Ser. No. 223,938
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—169



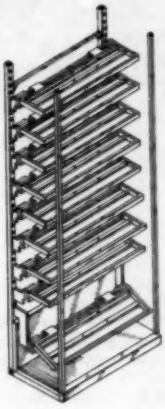
267,690
HOME COMPUTER TABLE
Joseph T. Verdesca, 5604 Lobello Dr., Dallas, Tex. 75229
Filed Oct. 21, 1980, Ser. No. 199,254
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—179



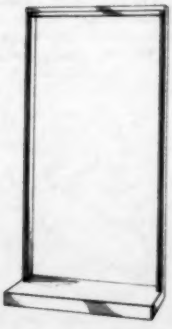
267,691
COMBINED COFFEE TABLE AND BOOK SHELF UNIT
Courtney White, 3352 La Mesa Dr., San Carlos, Calif. 94070
Filed Nov. 17, 1980, Ser. No. 207,513
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—179



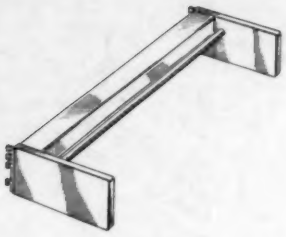
267,692
DISPLAY UNIT
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jan. 7, 1981, Ser. No. 223,175
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



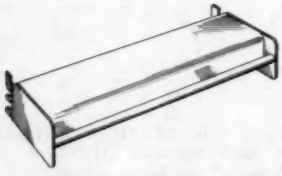
267,693
LIBRARY UNIT FOR ACCEPTING CANTILEVERED DOCUMENT-STORING COMPONENTS
Edmund T. Paquette, Shrewsbury, and Frederick J. Moriarty, Worcester, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Mar. 31, 1980, Ser. No. 135,712
Term of patent 7 years
Int. Cl. D6—*06, 04*
U.S. Cl. D6—191



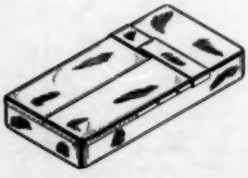
267,694
**DOCUMENTATION HANGER BAR FOR LIBRARY STORAGE UNIT**
Frederick J. Moriarty, Worcester, and Edmund T. Paquette, Shrewsbury, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Mar. 27, 1980, Ser. No. 134,706
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



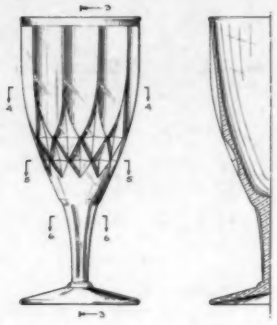
267,695
**DOCUMENTATION HANGER BAR**
Edmund T. Paquette, Shrewsbury, and Richard M. Latino, Worcester, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Apr. 17, 1980, Ser. No. 141,124
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

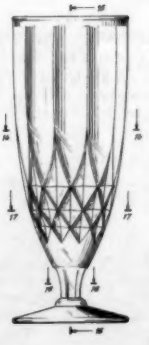


267,696
**CONTOURED BED SHEET**
Eugene A. Adams, 110 E. 176th St., Bronx, N.Y. 10453
Continuation-in-part of Ser. No. 946,853, Sep. 28, 1978, abandoned. This application Aug. 14, 1980, Ser. No. 178,222
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—264

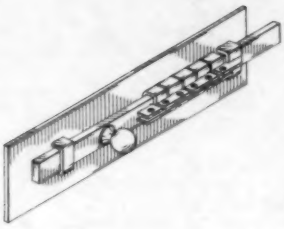


267,697
**BEVERAGE GLASS OR SIMILAR ARTICLE**
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Apr. 14, 1980, Ser. No. 140,180
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—11

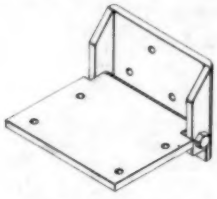




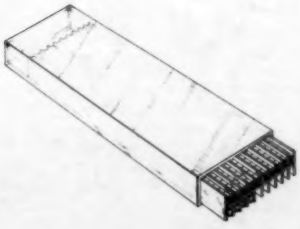
267,698
MULTIPLE ACCESS SLIDE-LOCK
David C. Domes, Reno, Nev., assignor to Carr-an Camper Mfg. Co., Reno, Nev.
Filed Nov. 3, 1980, Ser. No. 203,049
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—341



267,699
AIR COMPRESSOR BRACKET
William F. Prawl, 5636 Tahama St., Sacramento, Calif. 95841
Filed Nov. 20, 1980, Ser. No. 208,564
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—380



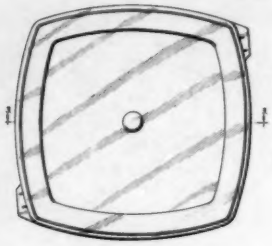
267,700
COMBINATION OF ARRAYS OF ELECTRICAL WIRE MARKERS IN AN INSERT AND BOX ARRANGEMENT
Lars Skarin, Otterbaäcken, Sweden, assignor to Partex Fabriksaktiebolag, Gullspang, Sweden
Filed Aug. 22, 1978, Ser. No. 936,268
Claims priority, application Sweden, Feb. 23, 1978, 78-0528
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—337



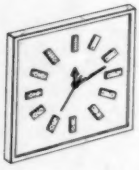
267,701
BOTTLE
John Pardo, Yonkers, N.Y., and David A. Jones, Dayton, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Feb. 3, 1981, Ser. No. 231,076
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—372

267,702
PACKAGING CONTAINER
James Swann, P.O. Box 584, South Brisbane, Queensland, 4101, Australia
Filed Jun. 16, 1980, Ser. No. 159,516
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424

267,703
CONTAINER LID OR THE LIKE
David O. Chase, Skaneateles, N.Y., and Paul H. Pfuhl, Wrentham, Mass., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Dec. 9, 1980, Ser. No. 214,600
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—435



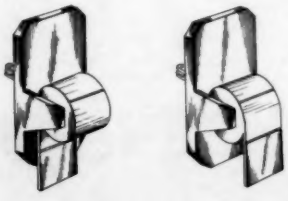
267,704
CLOCK
Robert J. Burke, 8 Adams Ct., Quincy, Mass. 02169
Filed Nov. 7, 1980, Ser. No. 205,000
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6



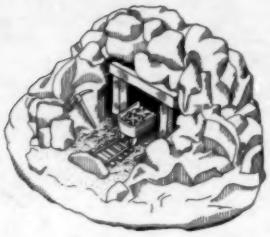
267,705
WRISTWATCH
Nobuhiro Kosugi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Dec. 12, 1980, Ser. No. 216,016
Claims priority, application Japan, Jun. 11, 1980, 55-023215
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

267,706
RING
Jeffrey H. Shapiro, Landing, N.J., assignor to A.B.L. Jewelers, Inc., New York, N.Y.
Filed Jan. 5, 1981, Ser. No. 222,507
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

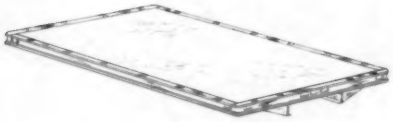
267,707
NOVELTY PIN
William E. Jarrett, 1465 Calvin, SE., Grand Rapids, Mich. 49507
Filed Nov. 13, 1980, Ser. No. 206,395
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—48



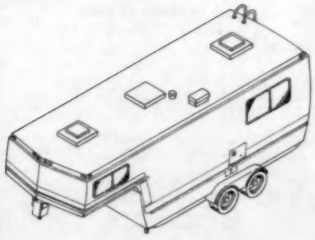
267,708
SCULPTURE
Roderick R. Boyakin, P.O. Box 6254, Richardson, Tex. 75080
Filed Oct. 7, 1980, Ser. No. 194,811
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



267,709
PLATFORM BODY FOR A TRUCK
John Y. Leaver, Elkhart, Ind., assignor to The Knapheide Mfg. Co., Quincy, Ill.
Filed Oct. 17, 1980, Ser. No. 197,858
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—96

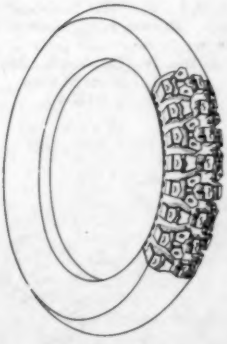


267,710
FIFTH WHEEL RECREATION VEHICLE
James F. King, 1995 Chestnut St., Apt.#107, San Francisco, Calif. 94123
Filed Dec. 26, 1979, Ser. No. 107,368
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103



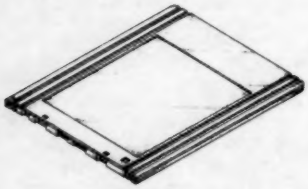
267,711
EXTENDABLE HANDLE FOR COLLAPSIBLE PERAMBULATOR
Giuseppe Perego, Via De Gasperi, 20043 Arcore (Milano), Italy
Filed Sep. 30, 1980, Ser. No. 192,535
Claims priority, application Italy, Mar. 31, 1980, 21347/80[U]
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—133

267,712
TIRE FOR A VEHICLE WHEEL
Hiroshi Tomoda, Ashiya, Japan, assignor to Dunlop Limited, London, England
Filed May 23, 1980, Ser. No. 152,685
Claims priority, application Japan, Dec. 11, 1979, 55-51920
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136

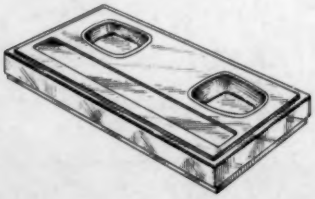


267,713
COMBINED ELECTRICAL CONNECTOR AND ADAPTER PLUG THEREFOR
Junichi Noda, Tokyo, and Isao Yanagisawa, Tokorozawa, both of Japan, assignors to Tamura Seisakusho Co., Ltd., Japan
Filed Sep. 15, 1980, Ser. No. 187,199
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

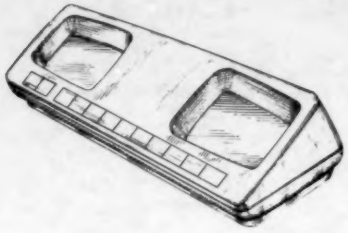
267,714
PRE-RECORDED CARTRIDGE VIDEO/AUDIO DISK
Osamu Tajima, Ayase; Takashi Yamamura, Yokohama; Yoichi Mita, Tokyo, and Masafumi Mochizuki, Yamato, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan
Filed Jul. 7, 1980, Ser. No. 166,781
Claims priority, application Japan, Feb. 1, 1980, 55-14482
Term of patent 14 years
Int. Cl. D14—*99*; D16—*05, 99*
U.S. Cl. D14—11



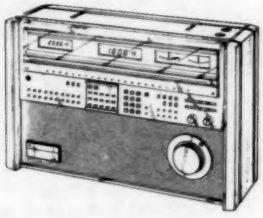
267,715
HOUSING FOR A TELEPHONE INSTRUMENT BASE
George M. Janda, Wheaton, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.
Filed Dec. 29, 1980, Ser. No. 220,336
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



267,716
DESK TELEPHONE HOUSING
George M. Janda, Wheaton, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.
Filed Dec. 29, 1980, Ser. No. 220,338
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

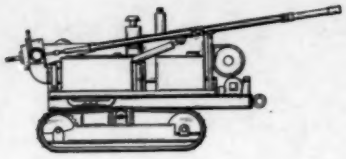


267,717
CLOCK RADIO
Shinzo Murakami, Higashiosaka; Kazumasa Takenaka, Katano; Kikuo Ohta, Ikoma; Masanori Hamada, Yao, and Kunio Hoshino, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 12, 1980, Ser. No. 158,999
Claims priority, application Japan, Dec. 20, 1979, 54-53707
Term of patent 14 years
Int. Cl. D14—*03*; D10—*01*
U.S. Cl. D14—70

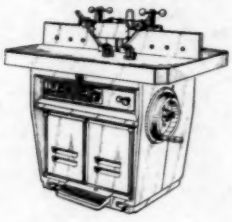


267,718
BEAM BALANCED PUMPING UNIT
John J. Gostomski, Omaha, Nebr., assignor to Hellstar Corporation, Wahoo, Nebr.
Filed Jul. 7, 1980, Ser. No. 165,870
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

267,719
SELF-PROPELLED DRILLING MACHINE
Stanford E. Case, 26627 Snell La., Los Altos Hills, Calif. 94022
Filed Jun. 13, 1980, Ser. No. 159,203
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—21



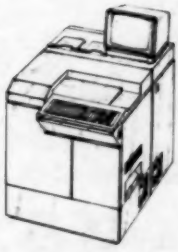
267,720
WOOD SHAPER
Peter Lawson, Sao Paulo, Brazil, assignor to Rockwell do Brasil Ind. E. Com. Ltda., Limeira, Brazil
Filed Nov. 19, 1979, Ser. No. 95,862
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—130



267,721
LINEAR ACTUATOR
Jean-Claude Dupuis, and Georges Roudavitch, both of Chatellerault, France, assignors to Societe Francaise d'Equipments pour La Navigation Aerienne (S.F.E.N.A.), Velizy Villacoublay, France
Filed Apr. 17, 1979, Ser. No. 30,850
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—148

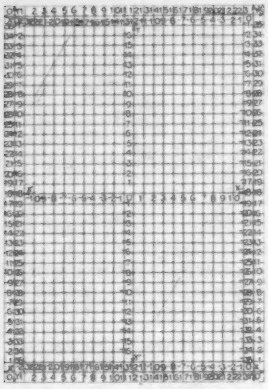
267,722
CAMERA
Rolf Schreiber, 23 Räcknitzer Weg, 8020 Dresden, Fed. Rep. of Germany
Filed Mar. 18, 1977, Ser. No. 816,850
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 12618070
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—08

267,723
ELECTRONIC COPYING MACHINE WITH A COMPUTER SYSTEM OR THE LIKE
Kunio Hara, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Feb. 4, 1981, Ser. No. 231,508
Claims priority, application Japan, Aug. 5, 1980, 55-31740
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—28



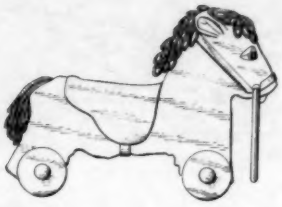
267,724
CLIP-ON SUNGLASSES OR SIMILAR ARTICLE
Norman D. Staller, Beverly, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 29, 1981, Ser. No. 258,644
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—112

267,725
POINT PLOTTING GUIDE
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405
Filed Jan. 4, 1980, Ser. No. 109,669
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—37



267,726
EMPLOYABILITY TESTING APPARATUS
Morris Ehrenreich, 7108 260 St., Floral Park, N.Y. 11004
Filed Oct. 14, 1980, Ser. No. 196,539
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

267,727
TOY RIDING HORSE
Walter P. Doe, East Aurora, N.Y., assignor to Playskool, Inc., Chicago, Ill.
Filed Dec. 11, 1980, Ser. No. 215,423
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—75



267,728
PUZZLE TOY
Richard L. Loncraine, London, England, assignor to Loncraine Broxton & Partners Limited, England
Filed Jul. 17, 1981, Ser. No. 284,329
Claims priority, application United Kingdom, Jan. 30, 1981, 998662
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104

267,729
TOY HOUSE
Michael W. Nuttall, South Pasadena, and Karen Lang, Rosemead, both of Calif., assignors to Tomy Corporation, Inc., Carson, Calif.
Filed Nov. 17, 1980, Ser. No. 207,249
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114

267,730
INDIAN D )LL
Ann Carlson, 31 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,870
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

267,731
INDIAN DOLL
Ann Carlson, 21 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,871
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

267,732
INDIAN DOLL
Ann Carlson, 31 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,872
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

267,733
INDIAN DOLL
Ann Carlson, 31 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,873
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

267,734
INDIAN DOLL
Ann Carlson, 31 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,874
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

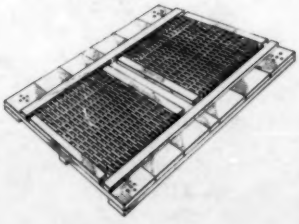
267,735
INDIAN DOLL
Ann Carlson, 31 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,879
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

267,736
INDIAN DOLL
Ann Carlson, 31 Birch Ave. North, Maple Lake, Minn. 55358
Filed Dec. 4, 1980, Ser. No. 212,895
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—182

267,737
BARBELL
Forrest S. Wright, 533 Hill, Rochester, Mich. 48063
Filed Jan. 19, 1981, Ser. No. 225,920
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—197

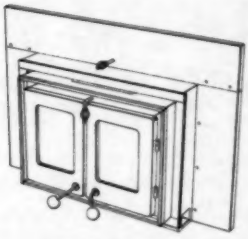
267,738
PUTTER HEAD
Charles Giebel, Phoenix, Ariz.; Charles D. Rambo, Escondido, Calif., and Gary Spencer, Phoenix, Ariz., assignors to Acushnet Company, New Bedford, Mass.
Continuation-in-part of Ser. No. 43,351, May 29, 1979. This application Sep. 19, 1980, Ser. No. 188,752
The portion of the term of this patent subsequent to Aug. 11, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

267,739
GOLF PRACTICE PLATFORM
Royal W. Hughes, 3675 Gordon Rd., Elkhart, Ind. 46516
Filed Jan. 8, 1981, Ser. No. 223,329
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

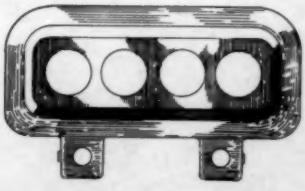


267,740
PROTECTIVE CORNER FOR LOBSTER TRAP
Emile A. P. Plante, 74 Badgers Island, Kittery, Me. 03904
Filed Oct. 30, 1980, Ser. No. 202,330
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

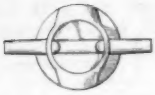
267,741
FIREPLACE INSERT
Robert A. Geiter, Coventry; Peter S. Albertsen, Warwick, both of R.I., and Robert A. Powell, Louisville, Ky., assignors to Jamestown Group, Providence, R.I.
Filed Jun. 29, 1981, Ser. No. 279,241
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



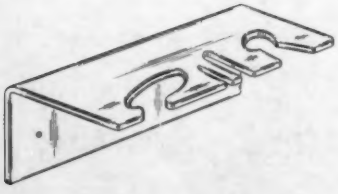
267,742
HALOGEN QUARTZ LAMP RADIANT HEATING MODULE
George E. McFarland, Carmichael, Calif., assignor to Thermomatics Associates, Ltd., Sacramento, Calif.
Filed Sep. 10, 1980, Ser. No. 185,786
Term of patent 14 years
Int. Cl. D23—*03*; D26—*05*
U.S. Cl. D23—127



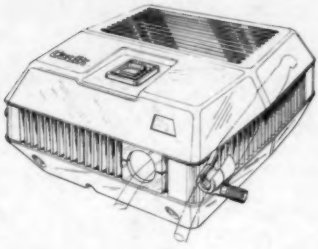
267,743
PRESSURE DIAPHRAGM
Joel N. Cunningham, San Diego; Richard M. Bucchianeri, Escondido, and Stephen H. O'Leary, Encinitas, all of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Dec. 15, 1980, Ser. No. 216,635
Term of patent 14 years
Int. Cl. D24—*02*; D23—*01*
U.S. Cl. D24—53



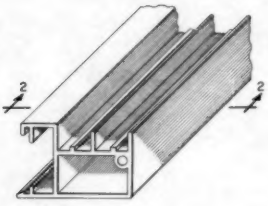
267,744
MEDICAL INSTRUMENT SUPPORT
Mary E. Flynn, St. Petersburg, Fla., assignor to Sandspur Enterprises, Inc., St. Petersburg, Fla.
Filed Apr. 17, 1981, Ser. No. 255,333
Term of patent 14 years
Int. Cl. D24—*99*; D6—*06*
U.S. Cl. D24—31



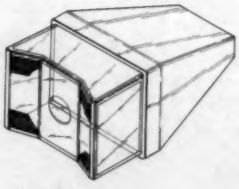
267,745
HOUSING FOR A DENTAL LIGHT INSTRUMENT OR THE LIKE
Wayne C. Seeley, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Aug. 29, 1980, Ser. No. 182,555
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



267,746
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, 375 N. 29th St., Camp Hill, Pa. 17011
Filed Sep. 11, 1980, Ser. No. 186,725
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



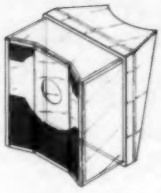
267,747
BICYCLE LIGHT
Knut O. Sassmannshausen, Rothenbach, 6580 Idar-Oberstein 3, Fed. Rep. of Germany
Filed Aug. 5, 1980, Ser. No. 175,445
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, MR 1496
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28



267,748
**BICYCLE LIGHT**

Knut O. Sassmannshausen, Rothenbach, 6580 Idar-Oberstein 3, Fed. Rep. of Germany

Filed Aug. 5, 1980, Ser. No. 175,446
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, MR 1496
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28



267,749
**COSMETIC CONTAINER**

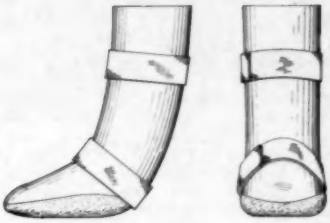
Pierre Ballereaud, 4 bis, route d'Ormoy, 28360 Dammarie, France

Filed Feb. 10, 1981, Ser. No. 233,158
Claims priority, application Switzerland, Aug. 12, 1980, 70.576
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—76

267,750
**PROTECTIVE SHOE FOR DOGS**

Sven E. Norstrom, Trangvagen 13 B, Sollieftea S-881 00, Sweden

Filed May 19, 1981, Ser. No. 265,004
Claims priority, application Sweden, Nov. 25, 1980, 80-2364
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—34



267,751
**GOLF CLUB CLEANER**

Richard W. Dobyns, 1351 Graymill Dr., Scotch Plains, N.J. 07076

Filed Sep. 10, 1980, Ser. No. 185,785
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—1

# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 25TH DAY OF JANUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Ghosh, Syamal K.; and Kelly, Frank D., 4,370,399, Cl. 430-58.000.

A. E. Staley Manufacturing Company: *See*—
Lehnhardt, William F.; Gibson, Paul W.; and Orthoefer, Frank T., 4,370,267, Cl. 260-123.500.

Abbey, Dean M. Energy saving override blower control for forced air systems. 4,369,916, Cl. 236-11.000.

Abbott Laboratories: *See*—
Haviv, Fortuna; DeNet, Robert W.; and Boulanger, William A., 4,370,339, Cl. 424-273.00P.
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., 4,370,417, Cl. 435-212.000.

Abe, Akira: *See*—
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, 4,370,365, Cl. 427-387.000.

Abe, Katsuro: *See*—
Izumi, Eiki; Honma, Kazuo; Abe, Katsuro; Uno, Masaaki; and Nakajima, Kichio, 4,369,625, Cl. 60-327.000.

Abe, Kuniomi: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,370,033, Cl. 351-206.000.

Abe, Masaharu: *See*—
Uekita, Masakazu; and Abe, Masaharu, 4,370,191, Cl. 156-307.700.
Uekita, Masakazu; Fushiki, Yasuo; and Abe, Masaharu, 4,370,386, Cl. 428-458.000.

Abe, Takeshi: *See*—
Yanase, Hiroshi; Kanno, Fukuo; and Abe, Takeshi, 4,370,292, Cl. 264-272.110.

Abe, Tsutomu: *See*—
Horikoshi, Katsunori; and Abe, Tsutomu, 4,370,381, Cl. 428-392.000.

Abelitis, Andris, to Klockner-Humboldt-Deutz AG. Apparatus for the production of cement clinker low in alkali from alkali-containing raw material. 4,370,127, Cl. 432-106.000.

Abner, Harold D., to Procter & Gamble Company, The. Composite can with compressed end to provide easy opening. 4,369,912, Cl. 229-5.600.

Abolafia, Oscar R.; Ameen, Joseph G.; and Elmore, Glenn V., to International Business Machines Corporation. Process for etching chrome. 4,370,197, Cl. 156-659.100.

Abraham, Fayez F., to Tyler Refrigeration Corporation. Refrigerated merchandizer display case adapted for energy conservation. 4,369,631, Cl. 62-82.000.

Abraham, Fayez F., to Tyler Refrigeration Corporation. Refrigerated merchandizer display case. 4,369,632, Cl. 62-82.000.

Ackley, E. Michael. Material orientation and printing apparatus. 4,369,702, Cl. 101-40.000.

Acme Burgess, Inc.: *See*—
Beiswenger, John L.; Moon, Howard R.; Smiesko, Frank A.; and Chaphalkar, Dhananjay, 4,369,921, Cl. 239-317.000.

Acrometal Products, Inc.: *See*—
Gerber, Dennis J., 4,369,601, Cl. 51-135.0BT.

Adachi, Hiroyuki: *See*—
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, 4,370,049, Cl. 355-3.0DD.

Adachi, Yukio: *See*—
Katagiri, Mikio; Sakota, Yukio; Hiroshige, Kunie; and Adachi, Yukio, 4,370,187, Cl. 156-244.230.

Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, to Agence Nationale de Valorisation. Water soluble agents effective as immunological adjuvants for stimulating in the host the immune response to various antigens and compositions, notably vaccines containing said water soluble agents. 4,370,265, Cl. 260-112.50R.

Addicott, Roy W.; and Capaldi, Bernard, to Sealed Motor Construction Company, Limited. Axial gap squirrel cage induction electric motor. 4,370,582, Cl. 310-211.000.

Adolph Coors Company: *See*—
Carter, Robert C., 4,369,821, Cl. 141-147.000.

Advanced Technology & Research, Inc.: *See*—
Higgins, William E.; and Lazzara, Richard C., 4,370,372, Cl. 428-116.000.

Aeroquip Corporation: *See*—
Fournier, Paul J. E.; and Kunz, Guenter O., 4,369,992, Cl. 285-256.000.

Affonso, Alvaro, to Hoelzle & Chelius KG. Device for the sterilization of fluid substances. 4,370,305, Cl. 422-292.000.

Ag-Electron, Inc.: *See*—
Lane, Marvin M.; and Garnett, Eric W. D., 4,369,886, Cl. 209-564.000.

Agarwal, Pawan K.; and Lundberg, Robert D., to Exxon Research and Engineering Co. Hot melt adhesive compositions of neutralized sulfonated EPDM and tackifier mixture. 4,370,432, Cl. 524-216.000.

Agehara Orimono Kogyo K.K.: *See*—
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, 4,370,365, Cl. 427-387.000.

Agence Nationale de Valorisation: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Sorbier, Pierre, 4,370,112, Cl. 425-3.000.

Agency of Industrial Science & Technology: *See*—
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,370,258, Cl. 252-429.00R.

AGFA-Gevaert Aktiengesellschaft: *See*—
Van Bouwel, Leo; Geyken, Erwin; Ertl, Franz; and Fleck, Adolf, 4,370,046, Cl. 354-324.000.

Ahlers, Egon; and Rentel, Alfred, to Seitz-Werke GmbH. Filling element for counterpressure filling machines. 4,369,820, Cl. 141-39.000.

Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground climber and slide. 4,369,965, Cl. 272-56.50R.

Airco, Inc.: *See*—
Maynard, Robert A., 4,369,958, Cl. 269-61.000.

Aircraft Dynamics Corporation: *See*—
Jones, Jack D.; and Glover, Russell K., 4,369,801, Cl. 134-58.00R.

Aisan Kogyo Kabushiki Kaisha: *See*—
Sugi, Fumio, 4,369,749, Cl. 123-439.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kazaoka, Kenichi; and Hattori, Takemi, 4,370,000, Cl. 297-284.000.
Masai, Hiroto, 4,370,074, Cl. 403-388.000.
Nishida, Koji; and Miyake, Osamu, 4,369,722, Cl. 112-103.000.

Aisin Warner Kabushiki Kaisha: *See*—
Matsumoto, Goichi; and Hayakawa, Yoichi, 4,369,671, Cl. 74-665.0GA.

Aita, Takayuki: *See*—
Nagaura, Toru; and Aita, Takayuki, 4,370,395, Cl. 429-219.000.

Aizawa, Hiroshi: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,370,037, Cl. 354-23.00D.

Aizawa, Tatsuo: *See*—
Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, 4,370,379, Cl. 428-341.000.

Akademie der Wissenschaften der DDR: *See*—
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; and Koch, Gerhard, 4,370,244, Cl. 252-39.000.

Akagi, Junko: *See*—
Azuma, Makoto; and Akagi, Junko, 4,370,180, Cl. 148-187.000.

Akagiri, Kenzo, to Sony Corporation. Gain control circuit for noise reduction system. 4,370,681, Cl. 360-68.000.

Aktiebolaget Karlstads Mekaniska Werkstad: *See*—
Gustafsson, Sten-Ake, 4,369,823, Cl. 144-340.000.

Alba-Waldensian, Inc.: *See*—
Vest, H. Ryland; and Boone, Walter S., 4,369,528, Cl. 2-69.000.

Albo, Ronald T., to Caterpillar Tractor Co. Apparatus and method for holding and tacking material. 4,370,183, Cl. 156-117.000.

Aleixo, Francisco H.: *See*—
Lasner, Jeffrey I.; and Aleixo, Francisco H., 4,369,787, Cl. 128-318.000.

Alexander, Samuel T. Gravimeter. 4,369,657, Cl. 73-382.00R.

Allen, David H., to Cam Gears Limited. Rack and pinion assembly. 4,369,669, Cl. 74-422.000.

Allen, John K.: *See*—
Allen, Kenneth R.; Allen, John K.; and McNally, Gordon G., 4,370,610, Cl. 324-52.000.

Allen, Kenneth R.; Allen, John K.; and McNally, Gordon G., to Bicc Public Limited Company. Locating sheath faults in underground power supply cables. 4,370,610, Cl. 324-52.000.

Allgood, Robert N.; Kelley, Stephen H.; Ulmer, Richard W.; and Wurzburg, Henry, to Motorola, Inc. Multiple function operational amplifier circuit. 4,370,632, Cl. 333-173.000.

Allied Colloids Limited: *See*—
Clarke, John B.; and Pitts, Leslie, 4,370,429, Cl. 524-60.000.

Allis-Chalmers Corporation: *See*—
Backlin, Robert R., 4,369,980, Cl. 277-235.00B.
Hanaway, Roger D.; and James, Larry R., 4,369,617, Cl. 56-14.600.
Rietman, David W., 4,369,861, Cl. 187-9.00E.

Allison, George M., III; and Wilt, Mason S., to Phillips Petroleum Company. High strength diene/monovinyl aromatic copolymer-based adhesives. 4,370,433, Cl. 524-274.000.

Alps Electric Co. Ltd.: *See*—
Ushida, Susumu, 4,370,626, Cl. 331-96.000.

Alvero, Ernesto J.: *See*—
Kelly, William R.; and Alvero, Ernesto J., 4,370,036, Cl. 354-1.000.

Ambert, Jack: *See*—
Breda, Frederic; Joaville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,370,394, Cl. 429-199.000.

Ambrosch, Friedrich; and Schwaebel, Rudolf, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of and device for avoiding rotor instability to enhance dynamic power limit of turbines and compressors. 4,370,094, Cl. 415-172.00A.

Amchem Products, Inc.: *See*—
Dollman, David Y., 4,370,173, Cl. 134-3.000.
Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., 4,370,177, Cl. 148-6.270.

Ameen, Joseph G.: *See*—
Abolafia, Oscar R.; Ameen, Joseph G.; and Elmore, Glenn V., 4,370,197, Cl. 156-659.100.

American Can Company: *See*—
Sorenson, Wayne P., 4,370,289, Cl. 264-113.000.

American Cyanamid Company: *See*—
Hoffman, Joseph A., 4,370,430, Cl. 524-96.000.
Kurose, Nancy S., 4,370,500, Cl. 564-304.000.
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,370,482, Cl. 548-150.000.

American Microsystems, Inc.: *See*—
Cooley, Richard F., 4,370,192, Cl. 156-345.000.
Hiltpold, William R., 4,369,564, Cl. 29-571.000.

Amiad Mutzarei Yiul: *See*—
Tavor, Chanany, 4,369,105, Cl. 137-101.310.

Amicel, Charles G., to Bertin & Cie. Surface finishing device. 4,369,602, Cl. 51-168.000.

Amieux, Jean-Claude, to Matra. Active nutation control system for space vehicle. 4,370,716, Cl. 364-434.000.

AMP Incorporated: *See*—
Dola, Frank P., 4,370,009, Cl. 339-31.00R.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,370,012, Cl. 339-75.0MP.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,370,017, Cl. 339-176.0MP.
Johnson, Tore R., 4,370,022, Cl. 350-96.210.
Loose, Winfield W., 4,370,529, Cl. 200-16.00D.

Ampex Corporation: *See*—
Tin, Lucas K., 4,370,620, Cl. 329-192.000.

AMSTED Industries Incorporated: *See*—
Upchurch, Thurman H.; and Bianco, Gerardo A., Jr., 4,370,719, Cl. 364-472.000.

Ancillotti, Francesco; Terzoni, Giuseppe; Micucci, Lidio; Maggioni, Paolo; and Panseri, Pietro, to Anic S.p.A. Terbutylating hydroxyaromatic compounds. 4,370,506, Cl. 568-785.000.

Anderson, Alan A. Window shade sealing system. 4,369,827, Cl. 160-41.000.

Anderson, Harry. Dye reducing composition for dye transfers, photographic transparencies and color prints. 4,370,402, Cl. 430-237.000.

Anderson, Kenneth L.: *See*—
Vidaurri, Fernando C.; and Anderson, Kenneth L., 4,370,470, Cl. 528-388.000.

Andersson, Ake. Filling machine. 4,369,898, Cl. 222-4.000.

Andow, Fumio; and Fujisawa, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Relay device. 4,370,571, Cl. 307-353.000.

Andreas Kufferath KG: *See*—
Schmidt, Sylvia; Eckert, Hansdieter; Holzinger, Wolfgang; and Holle, Dietrich, 4,370,200, Cl. 162-210.000.

Anelva Corporation: *See*—
Funaki, Hidefumi, 4,370,217, Cl. 204-298.000.

Anglin, James R.: *See*—
Ryu, Yumi P.; Anglin, James R.; and Singerman, Gary M., 4,370,245, Cl. 252-46.400.

Angus Chemical Co.: *See*—
Robinson, Glenn N.; and Seeney, Charles E., 4,370,171, Cl. 106-300.000.

Ani-Live Film Service Inc.: *See*—
Cooper, Sidney; and Jacob, Ezekiel J., 4,370,400, Cl. 430-126.000.

Anic S.p.A.: *See*—
Ancillotti, Francesco; Terzoni, Giuseppe; Micucci, Lidio; Maggioni, Paolo; and Panseri, Pietro, 4,370,506, Cl. 568-785.000.

Anschutz GmbH: *See*—
Gerstenberger, Friedrich; and Jaedicke, Ludwig, 4,369,759, Cl. 124-68.000.

Anzai, Makoto, to Nissan Motor Company, Limited. Plasma jet ignition system. 4,369,757, Cl. 123-620.000.

Aoki, Takashi: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, 4,369,695, Cl. 91-375.00A.

Aoyagi, Takaaki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Kawamura, Kenji; and Fukatsu, Shunzo, 4,370,318, Cl. 424-177.000.

Aoyama, Akira: *See*—
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, 4,370,365, Cl. 427-387.000.

Aoyama, Kazuho: *See*—
Omika, Hiroyoshi; Hara, Hajime; Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,370,453, Cl. 525-450.000.

Aoyama, Youichi: *See*—
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,370,634, Cl. 335-16.000.

Appel, Hans; and Brossmann, Gottfried, to Peroxide Chemie GmbH. Process for the continuous preparation of dialkylperoxydicarbonates. 4,370,276, Cl. 260-463.000.

Arai, Mamoru; Haneishi, Tatsuo; Nakajima, Mutsuo; Torikata, Akio; and Enokita, Ryuzo, to Sankyo Company, Limited. Mycoplanecin derivatives and their preparation. 4,370,266, Cl. 260-112.50R.

Arai, Tokuji: *See*—
Takaki, Kiyofumi, 4,370,403, Cl. 430-271.000.

Arakawa, Masatoshi: *See*—
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, 4,370,447, Cl. 525-39.000.

Araki, Yoshihiko: *See*—
Omika, Hiroyoshi; Hara, Hajime; Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,370,453, Cl. 525-450.000.

Arcangeli, Gerald T.: *See*—
Kelly, Patrick J.; and Arcangeli, Gerald T., 4,369,940, Cl. 244-3.210.

Arditty, Herve: *See*—
Puech, Claude; Arditty, Herve; and Papuchon, Michel, 4,370,612, Cl. 324-117.00R.

Argus Chemical Corporation: *See*—
Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, 4,370,459, Cl. 526-227.000.

Arikawa, Yoshijiro: *See*—
Takahashi, Yukio; Arikawa, Yoshijiro; and Yakushiji, Yoshio, 4,370,262, Cl. 252-464.000.

Arimatsu, Toshio; and Sakon, Tohatirou, to Sumitomo Rubber Industries, Ltd. Process for vulcanization of elastomer products. 4,370,283, Cl. 264-37.000.

Armbruster, Joseph M. Air circulating device. 4,370,155, Cl. 55-316.000.

Armstrong, Robert S.: *See*—
Armstrong, Robert S., Jr.; and Armstrong, Robert S., 4,369,569, Cl. 29-726.000.

Armstrong, Robert S., Jr.; and Armstrong, Robert S., to Armstrong & Sons. Tube-pulling apparatus. 4,369,569, Cl. 29-726.000.

Armstrong & Sons: *See*—
Armstrong, Robert S., Jr.; and Armstrong, Robert S., 4,369,569, Cl. 29-726.000.

Aronson, Orvil R. Self-centering fixture. 4,369,956, Cl. 269-34.000.

Arrowhead Research: *See*—
Tripp, Dwight E., 4,370,103, Cl. 417-298.000.

Asada, Miyozo: *See*—
Okamoto, Miyoshi; and Asada, Miyozo, 4,370,114, Cl. 425-131.500.

Asahi Glass Company, Ltd.: *See*—
Yanase, Hiroshi; Kanno, Fukuo; and Abe, Takeshi, 4,370,292, Cl. 264-272.110.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Horikoshi, Katsunori; and Abe, Tsutomu, 4,370,381, Cl. 428-392.000.
Kamide, Kenji; Okajima, Kunihiko; and Matsui, Toshihiko, 4,370,168, Cl. 106-177.000.
Mori, Koichi; and Nakao, Masafumi, 4,370,391, Cl. 428-697.000.
Nakajima, Osamu; Matsuoka, Yukinori; and Nakayama, Yoshiaki, 4,370,468, Cl. 528-335.000.

Asano, Hidejiro: *See*—
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, 4,370,387, Cl. 428-458.000.

Asano, Hiroyuki: *See*—
Morita, Masaaki; Yamaguchi, Michio; and Asano, Hiroyuki, 4,369,714, Cl. 104-250.000.

Asanuma, Yoshihiko; and Shimajiri, Yoshihumi, to Showa, Aluminum Kabushiki Kaisha. Device for releasing heat. 4,369,838, Cl. 165-185.000.

Aschenbach, Louis F., to Eaton Corporation. Miniature sealed toggle switch. 4,370,528, Cl. 200-6.0BB.

Asea Aktiebolag: *See*—
Eriksson, Gunno; and Nilarp, Anders, 4,370,671, Cl. 357-79.000.

Ashland Oil, Inc.: *See*—
Schafer, Robert J., 4,370,463, Cl. 528-78.000.

Ashland Petroleum Company, division of Ashland Oil, Inc.: *See*—
Carlos, Donald D., 4,370,218, Cl. 208-3.000.

Ashley, Charles R.: *See*—
Giggey, Robert W.; Serletic, Bernard T.; and Ashley, Charles R., 4,369,880, Cl. 206-63.300.

Asselin, Andre A.; and Humber, Leslie G., to Ayerst, McKenna & Harrison, Ltd. 6,7,8,9-Tetrahydro-3H-benz[E]indol-8-amine derivatives. 4,370,341, Cl. 424-274.000.

Association Foret-Cellulose: *See*—
Franclet, Andre; and Favereau, Pierre, 4,369,599, Cl. 47-74.000.

Astley, Graham J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Astley, Graham J., 4,369,541, Cl. 15-97.00B.

Ateliers des Charmilles, S.A.: *See*—
Kruth, Jean-Pierre, 4,370,536, Cl. 219-69.00M.

Ateliers et Chantiers de Bretagne: *See*—
Gagliardi, Georges, 4,370,091, Cl. 414-735.000.

Atkins, Sidney H., to Plessey Overseas Limited. Methods of making electrical connectors. 4,369,572, Cl. 29-879.000.

ATS Advanced Technics & Systems, S.A.: *See*—
Brisebarre, Marcel, 4,369,960, Cl. 271-5.000.
Audibert, Francoise: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.
Auerbach, Frederick F.: *See*—
Robbins, Richard F., 4,369,774, Cl. 128-133.000.
Automobiles Peugeot: *See*—
Perineau, Jean, 4,369,694, Cl. 91-368.000.
Avco Corporation: *See*—
Bloomfield, Warren, 4,369,630, Cl. 60-718.000.
Avery International Corporation: *See*—
Miller, Ezra D., 4,369,786, Cl. 604-390.000.
Axmark, Roger E.; and Satren, Ernest A., to Honeywell Inc. Dual detector flame sensor. 4,370,557, Cl. 250-554.000.
Ayerst, McKenna & Harrison, Ltd.: *See*—
Asselin, Andre A.; and Humber, Leslie G., 4,370,341, Cl. 424-274.000.
Ayres Technologies, Inc.: *See*—
Batchelor, William H.; and Batchelor, Douglas R., 4,369,751, Cl. 123-527.000.
Azuma, Kenkoku: *See*—
Doi, Kunihiro; Takeyama, Tetsu; and Azuma, Kenkoku, 4,370,301, Cl. 422-122.000.
Azuma, Makoto; and Akagi, Junko, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing power switching devices. 4,370,180, Cl. 148-187.000.
B. F. Goodrich Company, The: *See*—
Nehmey, Samuel D.; and Summers, James W., 4,370,286, Cl. 264-53.000.
Babb, Alvin A. Hunter's tree stand and seat. 4,369,858, Cl. 182-134.000.
Babcock-Hitachi, Ltd.: *See*—
Takahashi, Yukio; Arikawa, Yoshijiro; and Yakushiji, Yoshio, 4,370,262, Cl. 252-464.000.
Babich, Edward: *See*—
Offutt, Elmer B.; Babich, Edward; and Gillett, William G., 4,369,897, Cl. 221-227.000.
Bacal, Kazimierz; Wierusz, Lech B.; and Miszczyk, Janusz, to Wyzsza Szkola Inzynierska Im. J. Gagarina. Surgical strut for treatment of the back-bone. 4,369,770, Cl. 128-69.000.
Backlin, Robert R., to Allis-Chalmers Corporation. Fire ring for cylinder head gasket. 4,369,980, Cl. 277-235.00B.
Backstein, Guenter; Unger, Hans W.; Guenther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, to Rheinmetall GmbH. Underwater detonating device. 4,369,709, Cl. 102-229.000.
Bader, Karl O. Process and apparatus for converting sound waves into digital electrical signals. 4,370,523, Cl. 179-1.0DM.
Badische Corporation: *See*—
Sanders, John H., 4,369,549, Cl. 19-145.700.
Baehr, Frederick J., Jr.; Kemeny, George A.; and Barber, John P., to Westinghouse Electric Corp. Projectile launching system with resistive insert in the breech. 4,369,691, Cl. 89-8.000.
Bailey, Arvin K., Jr.; and Taylor, Richard S. Cooperative TV-FM cable splitter-ground module and housing therefor. 4,370,516, Cl. 174-59.000.
Bain, Douglas I.: *See*—
Engstrom, Gary G.; and Bain, Douglas I., 4,369,719, Cl. 110-345.000.
Bainbridge, Robert W.: *See*—
Dannels, W. Andrew; and Bainbridge, Robert W., 4,370,122, Cl. 425-543.000.
Dannels, W. Andrew; and Bainbridge, Robert W., 4,370,123, Cl. 425-543.000.
Baird, William C., Jr.: *See*—
Eberly, Paul E., Jr.; Mauldin, Charles H.; and Baird, William C., Jr., 4,370,224, Cl. 208-139.000.
Baker, Daniel A., to Whirlpool Corporation. Vacuum cleaner control. 4,370,690, Cl. 361-23.000.
Baker, Eugene E.: *See*—
Szarka, David D.; and Baker, Eugene E., 4,369,840, Cl. 166-214.000.
Baker, William T.: *See*—
Waycaster, Roy A.; Baker, William T.; and Bidle, Jerry D., 4,370,553, Cl. 250-343.000.
Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG: *See*—
Lange, Karl-Heinz, 4,370,040, Cl. 354-288.000.
Baldwin, Dorothy M.; Oharek, Frank J.; and Stahl, Curt, to United States of America, Navy. Rotating shutter system for improving the resolution of a visual display system. 4,370,677, Cl. 358-225.000.
Balint, Nikolaous K., to Standard Oil Company (Indiana). Catalyst system. 4,370,457, Cl. 526-137.000.
Banko, Anton, to Surgical Design. Ultrasonic transducer tips. 4,370,131, Cl. 433-86.000.
Barber, John P.: *See*—
Baehr, Frederick J., Jr.; Kemeny, George A.; and Barber, John P., 4,369,691, Cl. 89-8.000.
Barch, Herbert W.; Melle, Carl A.; McWilliams, Donald E.; and Hudson, Howard J., to PPG Industries, Inc. Stable sizing compositions used during forming of glass fibers and resulting fiber. 4,370,157, Cl. 65-3.430.
Bardon, Charles: *See*—
Gadelle, Claude; Burger, Jacques; and Bardon, Charles, 4,370,078, Cl. 405-264.000.
Barker, Clark R., to University of Missouri, The Curators of the. High pressure fluid jet cutting and drilling apparatus. 4,369,850, Cl. 175-393.000.
Barker, William I.; and Denham, Ernest J., to Suspendex (Proprietary) Limited. Tape fixing device. 4,370,185, Cl. 156-565.000.
Barnard, Timothy J.: *See*—
Izu, Masatsugu; Barnard, Timothy J.; and Gattuso, David A., 4,369,730, Cl. 118-723.000.
Barr, Samuel R., Jr., administrator: *See*—
LeBell, Clarence E.; and Barr, Samuel R., Sr., deceased, 4,369,937, Cl. 244-53.00R.
Barr, Samuel R., Sr., deceased: *See*—
LeBell, Clarence E.; and Barr, Samuel R., Sr., deceased, 4,369,937, Cl. 244-53.00R.
Barry, Leonard D. Rotary parallel arm loader and system. 4,370,085, Cl. 414-337.000.
Barry, Leonard D. Rotary loader and side coupling system. 4,370,086, Cl. 414-337.000.
Barton, Derek H. R.; Ley, Steven V.; and Meerholz, Clive A. Oxidation process using tellurium oxide catalysts. 4,370,497, Cl. 564-55.000.
BASF Aktiengesellschaft: *See*—
Bock, Gustav; and Fabian, Wolfgang, 4,370,270, Cl. 260-245.870.
Bott, Kaspar; Kaibel, Gerd; Hoffmann, Herwig; Irnich, Rudolf; and Schaefer, Eberhard, 4,370,491, Cl. 560-234.000.
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.
Neubert, Gerhard; and Wistuba, Eckehardt, 4,370,460, Cl. 526-329.200.
Bata Limited: *See*—
Rys-Sikora, John, 4,370,423, Cl. 521-84.000.
Batchelor, Douglas R.: *See*—
Batchelor, William H.; and Batchelor, Douglas R., 4,369,751, Cl. 123-527.000.
Batchelor, William H.; and Batchelor, Douglas R., to Ayres Technologies, Inc. Liquefied propane carbureitor modification system. 4,369,751, Cl. 123-527.000.
Bates, Ronald F.: *See*—
Wang, Chih C.; Pinch, Harry L.; and Bates, Ronald F., 4,370,739, Cl. 369-126.000.
Bateson, Simon V. R.; and Gerrard, Andrew, to British Leyland UK Limited. Vehicle transmission system. 4,369,866, Cl. 192-3.570.
Bauer, Jackson, to Collins and Aikman Corp. Process for treatment of polyester fabrics. 4,370,143, Cl. 8-493.000.
Baumann, Heinz, to Schaum-Chemie W. Bauer GmbH & Co KG. Plastic and foam plastic and method for making them. 4,370,424, Cl. 521-121.000.
Bayer Aktiengesellschaft: *See*—
Blank, Heinz U.; Wolters, Erich; Muller, Karl W.; and Rottloff, Gunter, 4,370,499, Cl. 564-200.000.
Bonse, Gerhard; and Blank, Heinz U., 4,370,498, Cl. 564-155.000.
Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, 4,370,450, Cl. 525-262.000.
Harnisch, Horst, 4,370,486, Cl. 549-46.000.
Klein, Alfons; Wedemeyer, Karlfried; and Thies, Jurgen, 4,370,505, Cl. 568-734.000.
Mitschke, Karl-Heinz; and Niederprum, Hans, 4,370,254, Cl. 252-355.000.
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,370,280, Cl. 260-465.600.
Scholl, Walter, 4,370,268, Cl. 260-146.00T.
Stammann, Gunter; Becker, Robert; Grolig, Johann; and Waldmann, Helmut, 4,370,275, Cl. 260-463.000.
Bayerische Motoren Werke A.G.: *See*—
Seidl, Jiri, 4,369,740, Cl. 123-90.450.
Wilka, Josef, 4,370,138, Cl. 440-112.000.
Beane, Tim E. Ladder with bracket attachments. 4,369,860, Cl. 182-214.000.
Bearden, Roby; and Stuntz, Gordon F., to Exxon Research and Engineering Co. Process for reducing coke formation in heavy feed catalytic cracking. 4,370,220, Cl. 208-108.000.
Beasley, Max M., to Tuftco Corporation. Tufting looper apparatus with opposed clip support. 4,369,720, Cl. 112-79.00A.
Beattie, William: *See*—
Weiner, Maurice; and Beattie, William, 4,370,597, Cl. 315-58.000.
Becker, Carl: *See*—
Skelly, James K.; Evans, David G.; and Becker, Carl, 4,370,144, Cl. 8-501.000.
Becker, Jon; Miller, Kirby G.; and Barney, Charles F., to GTE Products Corporation. Method of making tape transducer. 4,370,182, Cl. 156-52.000.
Becker, Robert: *See*—
Stammann, Gunter; Becker, Robert; Grolig, Johann; and Waldmann, Helmut, 4,370,275, Cl. 260-463.000.
Beckman Instruments, Inc.: *See*—
Luper, Charles R., 4,370,152, Cl. 55-281.000.
Beckwith, Thomas F. Container element combination for seed sprouting or plant culture. 4,369,598, Cl. 47-66.000.
Bedenbaugh, William E., to Sonoco Products Company. Yarn tube with pickup groove accommodating left hand and right hand pickup. 4,369,933, Cl. 242-125.100.
Beiswenger, John L.; Moon, Howard R.; Smiesko, Frank A.; and Chaphalkar, Dhananjay, to Acme Burgess, Inc. Hose-end sprayer. 4,369,921, Cl. 239-317.000.

Belanger, Inc.: *See—*
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Astley, Graham J., 4,369,541, Cl. 15-97.00B.

Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Astley, Graham J., to Belanger, Inc. Retractable wax, buff and polish apparatus for cars. 4,369,541, Cl. 15-97.00B.

Bell Telephone Laboratories, Incorporated: *See—*
Dynes, Robert C.; and Mochel, John M., 4,370,640, Cl. 338-25.000.
Fetter, Linus A.; Howard, Richard E.; Hu, Evelyn L.; and Jackel, Lawrence D., 4,370,359, Cl. 427-63.000.
Francis, Gordon K., 4,370,525, Cl. 179-16.00A.
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,370,521, Cl. 179-1.0SC.
Miller, Stewart E., 4,370,745, Cl. 371-8.000.
Moran, John C., 4,370,743, Cl. 370-67.000.

Bellet, Jean-Marie, to Bioself International Inc. Pocket calculator for family planning including a thermometric probe. 4,370,727, Cl. 364-705.000.

Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., to Npk za Kontrolno Zavarachni Raboti. Plasma torch for processing metals in the air and under water. 4,369,919, Cl. 239-79.000.

Beloev, Marin G.: *See—*
Garlanov, Dimo T.; Beloev, Marin G.; Hlebarov, Vladimir P.; Kolarova, Mariana V.; and Vangelov, Ivan V., 4,370,539, Cl. 219-121.0PW.

Beloit Corporation: *See—*
Wedel, Gregory L., 4,369,586, Cl. 34-125.000.

Bendix Corporation, The: *See—*
Bourdon, Normand C., 4,370,014, Cl. 339-97.00R.
Doniger, Jerry; Kirchhein, Albert T.; and Reynolds, Gibson, 4,370,706, Cl. 364-184.000.

Bennett, Gordon C. Paint can collar. 4,369,890, Cl. 220-85.00R.

Berenberg, John A.; Haggerty, William A.; Kegg, Richard L.; Schmenk, Myron J.; and Taylor, Ralph C., Jr., to Cincinnati Milacron Inc. Method for modifying programmed positions by using a programmably controlled surface sensing element. 4,370,721, Cl. 364-474.000.

Berger, Igor A. Wax occlusal rim warmer. 4,370,130, Cl. 433-32.000.

Bergfelt, Nils H.: *See—*
Small, Edward A.; Edwards, Richard H.; Eufusia, Eugene A.; Clary, Robert M.; and Bergfelt, Nils H., 4,369,876, Cl. 198-460.000.

Berguer, Ramon, to Lunax Corporation. Isothermic protective boot. 4,369,588, Cl. 36-9.00R.

Berkoff, William; and Martens, Walter O., to Berkoff, William. Wet and dry roasting apparatus and process for nut, bean and seed-like product. 4,369,585, Cl. 34-63.000.

Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish M., to General Electric Company. Easily assembled transverse magnetic printing head. 4,370,661, Cl. 346-74.500.

Bernhardt, Joerg, to Siemens Aktiengesellschaft. Method of producing liquid crystal display devices with alignment layer formed from organic tin compound of the type $R_nSnX_{4-n}$. 4,370,028, Cl. 350-341.000.

Bernstein, Joel E. Method and composition for treating and preventing irritation of the eyes. 4,370,324, Cl. 424-244.000.

Bertin & Cie: *See—*
Amicel, Charles G., 4,369,602, Cl. 51-168.000.

Beyer, Peter, to Boehringer Mannheim GmbH. Process for the preparation of α-[4-(4-chlorobenzoylaminoethyl)-phenoxy]-isobutyric acid. 4,370,495, Cl. 562-451.000.

Bhojwani, Arju H.: *See—*
Woebcke, Herman N.; Bhojwani, Arju H.; Gartside, Robert J.; and Johnson, Axel R., 4,370,303, Cl. 422-144.000.

Bianco, Gerardo A., Jr.: *See—*
Upchurch, Thurman H.; and Bianco, Gerardo A., Jr., 4,370,719, Cl. 364-472.000.

Bicc Limited: *See—*
Sullivan, Thomas; and Braddock, James E., 4,370,076, Cl. 405-132.000.

Bicc Public Limited Company: *See—*
Allen, Kenneth R.; Allen, John K.; and McNally, Gordon G., 4,370,610, Cl. 324-52.000.

Bicher, James I.; and Frinak, Stanley. Implantable microthermocouple member. 4,369,795, Cl. 128-736.000.

Bicker, Uwe: *See—*
Kampe, Wolfgang; Thiel, Max; Fauland, Erich; Bicker, Uwe; and Hebold, Gottfried, 4,370,323, Cl. 424-244.000.

Bidle, Jerry D.: *See—*
Waycaster, Roy A.; Baker, William T.; and Bidle, Jerry D., 4,370,553, Cl. 250-343.000.

Bieg, Hartmut; Jonas, Hans; Rosswurm, Heinz; Demmer, Wilhelm; and Dobel, Ludwig, to Sigri Elektrographit GmbH. Discharging device for an extrusion press. 4,369,683, Cl. 83-157.000.

Bingel, John P.; and Salmi, Robert W., to United States Steel Corporation. Dry magnetic separators for increased recovery or ore at high belt speeds. 4,370,225, Cl. 209-40.000.

Binsack, Rudolf: *See—*
Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, 4,370,450, Cl. 525-262.000.

Bioself International Inc.: *See—*
Bellet, Jean-Marie, 4,370,727, Cl. 364-705.000.

Biotest-Serum-Institut GmbH: *See—*
Kotitschke, Ronald; and Stephan, Wolfgang, 4,370,264, Cl. 260-112.00B.

Birbara, Philip J.: *See—*
Bok, Hendrik F.; and Birbara, Philip J., 4,370,356, Cl. 427-38.000.

Bird, Carl H.: *See—*
Bird, Thomas O.; White, Jack; and Bird, Carl H., 4,370,249, Cl. 252-62.000.

Bird, Thomas O.; White, Jack; and Bird, Carl H., to White, Jack E.; and Smith, Franklin N., Jr. Fire-retardant cellulose insulation and method of production. 4,370,249, Cl. 252-62.000.

Birnkraut, Hans-Walter: *See—*
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.

Bishop, Thomas R.; and Peil, Archie W., to Bowen Tools, Inc. Seal for an overshot and a method of doing same. 4,369,977, Cl. 277-1.000.

Black & Decker Inc.: *See—*
Gise, Glenn A.; and Edleblute, Calvin M., 4,369,577, Cl. 30-276.000.

Blandin, Jean-Claude; and Richard, Louis, to Nadia Nicoll, Societe a responsabilite limitee. Method for manufacturing a metal-plastics composite tube and apparatus for carrying out said method. 4,370,186, Cl. 156-203.000.

Blank, Heinz U.; Wolters, Erich; Muller, Karl W.; and Rottloff, Gunter, to Bayer Aktiengesellschaft. 3-Nitro-acetoacetanilides, processes for their preparation and their use. 4,370,499, Cl. 564-200.000.

Blank, Heinz U.: *See—*
Bonse, Gerhard; and Blank, Heinz U., 4,370,498, Cl. 564-155.000.

Blase, Robert. Twin torsional bicycle seat undercarriage. 4,369,998, Cl. 297-195.000.

Blaszuk, Paul R.: *See—*
Davis, Jack W.; and Blaszuk, Paul R., 4,370,540, Cl. 219-121.0LM.

Bleckmann, Ingo. Heat exchange assembly. 4,369,836, Cl. 165-171.000.

Bloodworth, Darrell R. Animal halter. 4,369,615, Cl. 54-24.000.

Bloomfield, Warren, to Avco Corporation. Combination drive system for ships. 4,369,630, Cl. 60-718.000.

Blumenberg, Guenther, to Kabel-und Metallwerke Gutehoffnungshuette AG. Method of making a gas-tight connection between a corrugated high quality tube and a high quality steel sleeve. 4,369,911, Cl. 228-173.00F.

Bock, Gustav; and Fabian, Wolfgang, to BASF Aktiengesellschaft. Novel pigmentary form of β-copper phthalocyanine. 4,370,270, Cl. 260-245.870.

Bock, Lawrence A.: *See—*
Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, 4,370,459, Cl. 526-227.000.

Boehringer Ingelheim GmbH: *See—*
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,370,327, Cl. 424-246.000.

Boehringer Mannheim GmbH: *See—*
Beyer, Peter, 4,370,495, Cl. 562-451.000.
Kampe, Wolfgang; Thiel, Max; Fauland, Erich; Bicker, Uwe; and Hebold, Gottfried, 4,370,323, Cl. 424-244.000.

Boer, Hubert, to diga - die gasheizung GmbH. Method for lining pipe mains having branching domestic connection pipes. 4,370,364, Cl. 427-238.000.

Boesenberg, Heinz; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, to Hoechst Aktiengesellschaft. Herbicidal compounds. 4,370,489, Cl. 560-62.000.

Boettcher, William C., to D.O.V.E. Equipment Corporation. Helical vending machine with pivot panel adjustment. 4,369,896, Cl. 221-75.000.

Bofors America, Inc.: *See—*
Wareham, William M., 4,369,659, Cl. 73-708.000.

Bogdanovic, Borislav, to Studiengesellschaft Kohle mbH. Alkali metal complex compounds. 4,370,488, Cl. 549-429.000.

Bohlen, Harald; Greschner, Johann; Kulcke, Werner; and Nehmiz, Peter, to International Business Machines Corporation. Alignment system for particle beam lithography. 4,370,554, Cl. 250-491.100.

Bok, Hendrik F.; and Birbara, Philip J., to Integrated Technologies, Inc. Method of meniscus coating. 4,370,356, Cl. 427-38.000.

Bolldorf, Kurt; and Bruckner, Ernst, to Pfaff Industriemaschinen GmbH. Embroidering machine with thread changer. 4,369,721, Cl. 112-98.000.

Bollier, J. F., to Patmark Consultants. Disappearing underground safe. 4,369,717, Cl. 109-45.000.

Bond, William B., to Du Pont de Nemours, E. I., and Company. Abrasion-resistant monofilament with molybdenum disulfide useful in the formation of papermaking belts. 4,370,375, Cl. 428-229.000.

Bonin, Werner: *See—*
Welter, Wolfgang; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Bonin, Werner, 4,370,345, Cl. 424-282.000.

Bonis, Laszlo J., to Composite Container Corporation. Heat-sealable sheet and container. 4,370,369, Cl. 428-35.000.

Bonomi, Angelo: *See—*
Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,370,394, Cl. 429-199.000.

Bonse, Gerhard; and Blank, Heinz U., to Bayer Aktiengesellschaft. Preparation of α-ketocarboxylic acid N-acylamides. 4,370,498, Cl. 564-155.000.

Boone, Walter S.: *See—*
Vest, H. Ryland; and Boone, Walter S., 4,369,528, Cl. 2-69.000.

Bosch, Eugen L., to Point 4 Data Corporation. Microprogram sequencer. 4,370,729, Cl. 364-200.000.

Bosch, Gerrit; Kok, Arnoldus W.; and Giethoorn, Harmen, to U.S. Philips Corporation. Method of manufacturing a permanent magnet

which is to be arranged in an air gap of a transformer core. 4,369,567, Cl. 29-607.000.
Bose, Phillip R., to Chevron Research Company. Coking hydrocarbonaceous oils with an aqueous liquid. 4,370,223, Cl. 208-125.000.
Bostroem, Theodore. Film identification method. 4,370,409, Cl. 430-496.000.
Bott, Kaspar; Kaibel, Gerd; Hoffmann, Herwig; Irnich, Rudolf; and Schaefer, Eberhard, to BASF Aktiengesellschaft. Continuous preparation of acetic acid esters. 4,370,491, Cl. 560-234.000.
Bouchard, Andre C.; Hall, Harold H., Jr.; and Loughridge, Frederick A., to GTE Products Corporation. Method of making a photoflash lamp having new lead seal structure. 4,369,556, Cl. 29-25.150.
Boulanger, William A.: *See*—
Haviv, Fortuna; DeNet, Robert W.; and Boulanger, William A., 4,370,339, Cl. 424-273.00P.
Bourdon, Normand C., to Bendix Corporation, The. Insulsted wire termination device. 4,370,014, Cl. 339-97.00R.
Bourgraf, Elroy E.; Dunn, Robert E.; and Vance, Ronald D., to Weil, Burt. One man cart for articles. 4,369,985, Cl. 280-641.000.
Boussekey, Bernard: *See*—
Chielens, Alain; Boussekey, Bernard; and Deschamps, Bernard, 4,370,128, Cl. 432-115.000.
Bouvet, Jean M.; and Quemerais, Philippe, to Regie Nationale Des Usines Renault. Electrohydraulic translation apparatus, in particular permitting control of a pressure in an automatic transmission. 4,369,804, Cl. 137-85.000.
Bovis, Claude: *See*—
Depetris, Norbert; and Bovis, Claude, 4,370,445, Cl. 524-742.000.
Bowen Tools, Inc.: *See*—
Bishop, Thomas R.; and Peil, Archie W., 4,369,977, Cl. 277-1.000.
Bozler, Gerhard: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,370,312, Cl. 424-1.500.
Brackmann, Warren A.; and Snaidr, Stanislav M., to Rothmans of Pall Mall Canada Limited. Feed mechanism for tobacco cutting machines. 4,369,797, Cl. 131-109.0AB.
Braddock, James E.: *See*—
Sullivan, Thomas; and Braddock, James E., 4,370,076, Cl. 405-132.000.
Braithwaite, Charles H., Jr. Method for removing adhesive residues with an emulsion cleaner. 4,370,174, Cl. 134-7.000.
Brake, Loren D., to Du Pont de Nemours, E. I., and Company. Catalyst for methylamines production. 4,370,503, Cl. 564-474.000.
Brandon, Deryck. Apparatus and method for heating, thawing and/or demoisturizing materials and/or objects. 4,370,534, Cl. 219-10.55A.
Brandt, Dieter, to Wandel & Goltermann GmbH & Co. Synchronization extractor responsive to digital signals. 4,370,617, Cl. 328-63.000.
Brantingham, George L., to Texas Instruments Incorporated. System and method of driving a multiplexed liquid crystal display by varying the frequency of the drive voltage signal. 4,370,647, Cl. 340-784.000.
Bratanov, Anton A.: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,370,473, Cl. 536-2.000.
Brauer, Hans, to Kocks Technik GmbH & Company. Method and apparatus for cooling wire rod. 4,369,645, Cl. 72-201.000.
Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, to Proge Groupement d'Interet Economique. Salt composition usable as a fused electrolyte in accumulators. 4,370,394, Cl. 429-199.000.
Brethon, Jean-Pierre; Guiho, Jean-Paul; Taniel, Gerard; and Viel, Georges, to Commissariat a l'Energie Atomique; and Societe CGR-MeV. Device for storing a source of photons and for irradiating a body by the radiation from said source. 4,370,555, Cl. 378-120.000.
Bretl, Wayne E.: *See*—
Johnson, Fred D.; Flasza, Michael D.; and Bretl, Wayne E., 4,370,674, Cl. 358-74.000.
Brevignon, Michele: *See*—
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, 4,370,026, Cl. 350-163.000.
Breznican, Stephen J., to Westinghouse Electric Corp. Two-speed motor control. 4,370,605, Cl. 318-773.000.
Briggs, George R., to RCA Corporation. Vehicle multiplex system. 4,370,561, Cl. 307-9.000.
Brighty, Sidney G. Plotting device. 4,369,583, Cl. 33-403.000.
Briles, Franklin S. Blind fastener with work gripping head. 4,370,081, Cl. 411-43.000.
Brill, Joseph H. Diaphragm pump. 4,370,108, Cl. 417-430.000.
Brisebarre, Marcel, to ATS Advanced Technics & Systems, S.A. Device for separating bank notes. 4,369,960, Cl. 271-5.000.
British Leyland UK Limited: *See*—
Bateson, Simon V. R.; and Gerrard, Andrew, 4,369,866, Cl. 192-3.570.
Brocklehurst, Charles E.: *See*—
Griffith, William C., Jr.; and Brocklehurst, Charles E., 4,369,723, Cl. 112-281.000.
Bron, Dan. Self-regulating nozzle for a liquid supply line. 4,369,923, Cl. 239-542.000.
Brooks, Joe: *See*—
Henson, George S.; and Brooks, Joe, 4,369,845, Cl. 166-298.000.
Brossmann, Gottfried: *See*—
Appel, Hans; and Brossmann, Gottfried, 4,370,276, Cl. 260-463.000.
Brown, Kenard D. Automatic pump for deep wells. 4,370,105, Cl. 417-360.000.
Brownell, George L.; Davie, William R.; and Fields, Marvin C., to United States Steel Corporation. Removal of iron compounds from organic process streams. 4,370,240, Cl. 210-673.000.
Browning Engineering Corporation: *See*—
Browning, James A., 4,370,538, Cl. 219-121.0PY.
Browning, James A., to Browning Engineering Corporation. Method and apparatus for ultra high velocity dual stream metal flame spraying. 4,370,538, Cl. 219-121.0PY.
Bruce, Kenneth E.; Conway, John W.; Lombardo, Ralph M., Jr.; and Tarbox, Bruce H., to Honeywell Information Systems Inc. Logic system for selectively reconfiguring an intersystem communication link. 4,370,708, Cl. 364-200.000.
Bruckner, Ernst: *See*—
Bolldorf, Kurt; and Bruckner, Ernst, 4,369,721, Cl. 112-98.000.
Bruckner, Hans: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,370,312, Cl. 424-1.500.
Bruel, Michel, to Commissariat a l'Energie Atomique. Process for fast droping of semiconductors. 4,370,176, Cl. 148-1.500.
Bruggeman, William L.; and Myers, Claude B., to Cat Pumps Corporation. Sand blasting apparatus. 4,369,607, Cl. 51-427.000.
Brugmans, Johannes T., to Koninklijke Emballage Industrie Van Leer B.V. Metallized labels for containers. 4,370,377, Cl. 428-327.000.
Brunn GmbH & Co. KG: *See*—
Brunn, Martin, 4,369,628, Cl. 60-618.000.
Brunn, Martin, to Brunn GmbH & Co. K.G. Method and apparatus for improving the firedamp safety of an internal combustion engine for underground operation. 4,369,628, Cl. 60-618.000.
Brunswick Corporation: *See*—
Grover, Richard L.; and Humphrey, William D., 4,369,894, Cl. 220-414.000.
Bryan, Paul J.; and Morse, Daniel R., to Du Pont de Nemours, E. I., and Company. Delay blasting cap. 4,369,708, Cl. 102-202.130.
Bryant-Poff, Inc.: *See*—
Taylor, Edmund P., 4,369,870, Cl. 193-23.000.
Budde, Volker, to Daimler-Benz Aktiengesellschaft. Short circuit fuse for electrical igniters. 4,369,707, Cl. 102-202.200.
Bugaut, Andree; Thouvenin, Philippe; and Cotteret, Jean, to L'Oreal. Hair-dyeing compositions based on para-phenylenediamine and ortho-aminophenol. 4,370,142, Cl. 8-407.000.
Bugg, Richard E. F.; and Parkyn, Derek J., to U.S. Philips Corporation. Data transmission. 4,370,747, Cl. 375-62.000.
Buja, Frederick J. Modular rotary molding machine. 4,370,124, Cl. 425-556.000.
Bunce, Roger A.; Gibbons, John E. C.; and Kricka, Larry J., to National Research Development Corporation. Pipette means. 4,369,664, Cl. 73-864.120.
Bunker Ramo Corporation: *See*—
Hutter, Harold G.; and Francis, Leonard J., 4,370,015, Cl. 339-97.00P.
Bunnell, Thomas K., to Dolan Corrugated Containers Limited. Rotary die cutters having magnetically-attracted waste ejector. 4,369,682, Cl. 83-112.000.
Bunri Industry Co., Ltd.: *See*—
Tashiro, Minoru; and Uemura, Takaaki, 4,370,228, Cl. 210-223.000.
Burgbacher, Martin, to Papst Motoren GmbH und Co. KG. Reluctance motor. 4,370,580, Cl. 310-67.00R.
Burger, Jacques: *See*—
Gadelle, Claude; Burger, Jacques; and Bardon, Charles, 4,370,078, Cl. 405-264.000.
Burgoon, Jack L.; and Karpanty, David J., to Scott & Fetzer Company, The. Floor cleaning machine. 4,369,540, Cl. 15-49.00R.
Burk, Robert C., to McDonnell Douglas Corporation. 3-D Chopped-fiber composites. 4,370,390, Cl. 428-614.000.
Burkin, Alfred R.: *See*—
Dain, Richard J.; Manning, Gary D.; and Burkin, Alfred R., 4,370,237, Cl. 210-638.000.
Burlington Industries, Inc.: *See*—
Janicz, Thomas H., 4,370,373, Cl. 428-151.000.
Burmeister, Fredrik: *See*—
Heijola, Pentti; and Burmeister, Fredrik, 4,369,853, Cl. 180-117.000.
Burnett, William R.; and Thompson, Charles T., to Varian Associates, Inc. Multiple threaded fastener assembly. 4,370,083, Cl. 411-87.000.
Burnette, Clarence S. Wood burning stove. 4,369,761, Cl. 126-63.000.
Burney, Charles F.: *See*—
Becker, Jon; Miller, Kirby G.; and Burney, Charles F., 4,370,182, Cl. 156-52.000.
Burroughs Corporation: *See*—
Chadra, David P., 4,370,730, Cl. 364-900.000.
Greig, George H.; and Pettigrew, Archibald M., 4,370,683, Cl. 360-73.000.
Richardson, Harvey J., 4,370,688, Cl. 360-99.000.
Burton, Bruce L.; and Doorakian, George A., to Dow Chemical Company, The. Organo phosphorus-containing compounds as catalysts for deblocking blocked isocyanates. 4,370,461, Cl. 528-45.000.
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Exner, Stanislav; Skoda, Stanislav; and Janousek, Jan, to Vyzkumny ustav bavlnarsky. Apparatus for spinning-in yarns in open-end rotor spinning units. 4,369,620, Cl. 57-263.000.
Buschbom, Floyd E.; and Hutchison, Marion, to Veda, Inc. Fluid drive system. 4,369,855, Cl. 180-212.000.
Bussard, Robert W., to FDX Associates, L.P. Fusion-fission power generatiag device having fissile-fertile material within the region of the toroidal field coils generating means. 4,370,295, Cl. 376-133.000.
Bussard, Robert W., to FDX Associates, L.P. Toroidal fusion reactor having ohmic heating coil substantially adjacent toroidal fusion region. 4,370,296, Cl. 376-133.000.

Busse, Michael J.; and Lees, Kenneth A., to Glaxo Group Limited. Topically administrable pharmaceutical compositions containing anti-inflammatory steroids. 4,370,322, Cl. 424-243.000.

Busse, Oswald; and Klesper, Hugo, to Passavant-Werke AG & Co. KG. Sludge de-watering plant with a plurality of filter presses connected in parallel. 4,370,232, Cl. 210-224.000.

Bussey, Marlin G.: *See*—
Zabrocki, Vincent S.; and Bussey, Marlin G., 4,370,378, Cl. 428-339.000.

Butterwick, Gilbert N., to RCA Corporation. Evaporator support assembly for a photomultiplier tube. 4,370,585, Cl. 313-102.000.

Butterworth, Archibald J. Parking devices for vehicles. 4,369,854, Cl. 180-201.000.

Bye, Ashley D., to Imperial Chemical Industries Limited. Transition metal composition and production thereof. 4,370,449, Cl. 525-247.000.

Byer, Richard J., to Du Pont de Nemours, E. I., and Company. Method for producing a long scale direct-positive photographic emulsion. 4,370,411, Cl. 430-596.000.

Cabot Corporation: *See*—
Williams, Frank R.; and Hurst, Ronald C., 4,370,308, Cl. 423-450.000.

California Institute of Technology: *See*—
Stirn, Richard J., 4,370,510, Cl. 136-262.000.

Callantine, Merritt R.: *See*—
Greaney, Martin O.; and Callantine, Merritt R., 4,370,321, Cl. 424-243.000.

Calvin, Douglas J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Astley, Graham J., 4,369,541, Cl. 15-97.00B.

Cam Gears Limited: *See*—
Allen, David H., 4,369,669, Cl. 74-422.000.

Camp, John P. Protective fire hydrant guard. 4,369,807, Cl. 137-296.000.

Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., to Pfizer Inc. Cardiac stimulant 1-(3- or 4-substituted piperidino)phthalazines. 4,370,328, Cl. 424-250.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Patmore, David J.; Ranganathan, Ramaswami; Khulbe, Chandra P.; and Pruden, Barry B., 4,370,221, Cl. 208-112.000.

Canfield, Allen B., to Rexham Corporation. Top heat sealing unit for pouches. 4,369,611, Cl. 53-127.000.

Canon Kabushiki Kaisha: *See*—
Hara, Toshitami; and Matsumoto, Shigeyuki, 4,370,668, Cl. 346-140.00R.
Harigaya, Isao; and Tamamura, Hideo, 4,370,043, Cl. 354-173.000.
Hirayama, Kazuhiro; and Ito, Michio, 4,370,053, Cl. 355-14.00D.
Ikemori, Keiji, 4,370,031, Cl. 350-426.000.
Isohata, Junji; and Yamamoto, Hironori, 4,370,054, Cl. 355-53.000.
Kitamura, Takashi, 4,370,678, Cl. 358-285.000.
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, 4,370,049, Cl. 355-3.0DD.
Murakami, Katsumi; Furuichi, Katsushi; and Honma, Toshio, 4,370,052, Cl. 355-14.00R.
Noda, Atsushi; and Hanagata, Takayoshi, 4,370,666, Cl. 346-76.0PH.
Shigenobu, Michio; and Ohkubo, Masaharu, 4,369,729, Cl. 118-60.000.
Shirasaki, Takayuki, 4,370,019, Cl. 350-6.600.
Tateoka, Masamichi, 4,370,032, Cl. 350-476.000.
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,370,037, Cl. 354-23.00D.

Canron Corporation: *See*—
Lund, Raymond R., 4,370,093, Cl. 414-779.000.
von Beckmann, Helmuth, 4,369,712, Cl. 104-12.000.

Capaldi, Bernard: *See*—
Addicott, Roy W.; and Capaldi, Bernard, 4,370,582, Cl. 310-211.000.

Capek, Raymond G.; and Garrett, Elgie E., to Zenith Radio Corporation. Isolating connector. 4,370,630, Cl. 333-24.00C.

Caracappa, Michael G., to RCA Corporation. Signal correlation means employing charged-coupled device type shift registers. 4,370,726, Cl. 364-604.000.

Carignani, Giancarlo; and Cipriani, Aldo, to Shia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Process for obtaining permanently self-extinguishing cellular materials which have a low density and high mechanical characteristics. 4,370,425, Cl. 521-138.000.

Carl Zeiss-Stiftung: *See*—
Trotscher, Otto; Stacklies, Horst; and Machler, Meinrad, 4,370,058, Cl. 356-125.000.

Carlos, Donald D., to Ashland Petroleum Company, division of Ashland Oil, Inc. Inorganic salt oxidation promoters for hydrocarbons. 4,370,218, Cl. 208-3.000.

Carroll, John T.; and Yamat, Miguel B., to Siemens-Allis, Inc. Undervoltage release device for a circuit breaker. 4,370,635, Cl. 335-20.000.

Carsac, Claude: *See*—
de Sivry, Bruno; Sudreau, Bernard; Carsac, Claude; Hamon, Jean-Pierre; and Fuzeau, Michel, 4,370,541, Cl. 219-121.0EC.

Carter, Robert C., to Adolph Coors Company. Cam actuated filler valve. 4,369,821, Cl. 141-147.000.

Casiday, John J. Window unit for storm windows. 4,369,829, Cl. 160-120.000.

Cason, William C.; Kuecker, Ward A.; and Stratton, Susan D., to International Business Machines Corporation. Ghost cursor in display all codes mode. 4,370,645, Cl. 340-709.000.

Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, to Farmitalia Carlo Erba S.p.A. 11-Deoxy-carminomycin compounds. 4,370,474, Cl. 536-6.400.

Cat Pumps Corporation: *See*—
Bruggeman, William L.; and Myers, Claude B., 4,369,607, Cl. 51-427.000.

Caterpillar Tractor Co.: *See*—
Albo, Ronald T., 4,370,183, Cl. 156-117.000.
Hendrickson, Vergil P., 4,369,826, Cl. 152-410.000.
Szentes, John F., 4,369,651, Cl. 73-119.00A.

Cavitron Corporation: *See*—
Stempel, John A., 4,370,133, Cl. 433-171.000.

Cayer, Pierre W. Dispenser for rolled sheet goods. 4,369,929, Cl. 242-55.420.

CBS Industries: *See*—
Zopf, David E., 4,369,949, Cl. 248-632.000.

Ceintrey, Claude; and Detain, Monique, to Rhone-Poulenc Systemes. Presensitized plastic card, tamperproof identification card prepared therefrom, and process for manufacture of tamperproof identification card. 4,370,397, Cl. 430-10.000.

Celanese Corporation: *See*—
DeGuia, Andrea A., 4,370,438, Cl. 524-412.000.
Lee, Shu M.; and Gezovich, Donald M., 4,370,141, Cl. 8-115.500.

Centro Ricerche Fiat S.p.A.: *See*—
Palazzetti, Mario; and Salotti, Gianfranco, 4,370,562, Cl. 307-38.000.
Venturello, Giorgio; and Salvatore, Osvaldo, 4,369,663, Cl. 73-862.040.

Ceshkovsky, Ludwig; and Dakin, Wayne R., to Discovision Associates. Gain correction system for videodisc player apparatus. 4,370,679, Cl. 358-318.000.

Cha, Chang Y., to Occidental Oil Shale, Inc. Method for igniting an in situ oil shale retort. 4,369,841, Cl. 166-251.000.

Cha, Chang Y., to Occidental Oil Shale, Inc. Analyzing oil shale retort off-gas for carbon dioxide to determine the combustion zone temperature. 4,369,842, Cl. 166-251.000.

Chadra, David P., to Burroughs Corporation. Ram buffer memory circuit system for train printer-data link processor. 4,370,730, Cl. 364-900.000.

Chan, John Y., to Fairchild Camera and Instrument Corporation. Sense amplifier and sensing methods. 4,370,737, Cl. 365-203.000.

Chang, Mark S.: *See*—
O'Toole, Michael M.; Liu, En-Den D.; and Chang, Mark S., 4,370,405, Cl. 430-312.000.

Chang, Richard S.; and Levine, Richard S., to Mattel, Inc. Electronic bowling game. 4,369,971, Cl. 273-85.00G.

Chaphalkar, Dhananjay: *See*—
Beiswenger, John L.; Moon, Howard R.; Smiesko, Frank A.; and Chaphalkar, Dhananjay, 4,369,921, Cl. 239-317.000.

Chapin, Carole N.; Kelm, Gary R.; and Shelton, David L., to Procter & Gamble Company, The. Skin conditioning compositions. 4,370,319, Cl. 424-184.000.

Charek, Leonard T., to Firestone Tire & Rubber Company, The. Trailer with mass restraint. 4,369,983, Cl. 280-81.00A.

Chasek, Norman E. Responsive traffic light control system and method based on conservation of aggregate momentum. 4,370,718, Cl. 364-436.000.

Chedid, Louis: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Chen, Catherine S. H.; and Luh, Yuhshi, to Mobil Oil Corporation. Oil recovery by surfactant-alcohol waterflooding. 4,370,243, Cl. 252-8.55D.

Chen, Hong: *See*—
Chen, Jen; and Chen, Hong, 4,369,543, Cl. 15-319.000.

Chen, Jen; and Chen, Hong. Remote-control radio vacuum cleaner. 4,369,543, Cl. 15-319.000.

Chen, Michael C.: *See*—
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., 4,370,417, Cl. 435-212.000.

Chen, Wilkie Y.: *See*—
Purcell, John R.; Chen, Wilkie Y.; and Toffolo, Walter E., 4,369,636, Cl. 62-514.00R.

Cheng, Paul J., to Phillips Petroleum Company. Method for removing carbon black deposits. 4,370,309, Cl. 423-461.000.

Chevron Research Company: *See*—
Bose, Phillip R., 4,370,223, Cl. 208-125.000.
deVries, Louis; and King, John M., 4,370,246, Cl. 252-46.400.
Jensen, Harbo P., 4,370,239, Cl. 210-668.000.
Miller, Stephen J., 4,370,219, Cl. 208-59.000.

Chiba, Akio; and Funahashi, Jun, to Nissan Motor Company, Ltd. Fuel tank fitting structure. 4,369,981, Cl. 280-5.00A.

Chielens, Alain; Boussekey, Bernard; and Deschamps, Bernard, to Fives-Cail Babcock. Protective device for a discharge end of a tubular rotary kiln. 4,370,128, Cl. 432-115.000.

Chloe-Chimie: *See*—
Depetris, Norbert; and Bovis, Claude, 4,370,445, Cl. 524-742.000.

Choay, Jean: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier,

Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Chou, Clifford K. F.; and McCarthy, Paul, to United States Steel Corporation. Wire galvanizer cooler. 4,369,802, Cl. 134-122.00R.

Christensen, George L. Scabbard for firearms. 4,369,904, Cl. 224-250.000.

Chu, James C.; Crane, Patrick E.; D'Agostino, Jack V.; and Schwartz, Paul M., to Sperry Corporation. Antenna. 4,370,659, Cl. 343-772.000.

Chu, Kwo R.: *See*—
Sprangle, Phillip A.; Smith, Robert A.; and Chu, Kwo R., 4,370,621, Cl. 330-4.000.

Chunn, Robert E. Card game with trump suits and trump words. 4,369,976, Cl. 273-303.000.

Church, Leslie G., to Propeller Design Limited. Marine propeller. 4,370,096, Cl. 416-189.000.

Chvapil, Milos. Contraceptive sponge - diaphragm bilayer. 4,369,773, Cl. 128-127.000.

Cianciolo, Cosmo J.; Snyder, John R.; and King, Roderick V., to Ethyl Products Company. Closure with smooth edge. 4,369,643, Cl. 72-75.000.

Ciba-Geigy AG: *See*—
Clubley, Brian G.; Hyde, Thomas G.; and Keenan, John F. E., 4,370,281, Cl. 260-966.000.

Ciba-Geigy Corporation: *See*—
Deiner, Hans, 4,370,366, Cl. 427-389.900.
Lienhard, Paul; and Roueche, Armand, 4,370,431, Cl. 524-100.000.
Skelly, James K.; Evans, David G.; and Becker, Carl, 4,370,144, Cl. 8-501.000.

Cincinnati Milacron Inc.: *See*—
Berenberg, John A.; Haggerty, William A.; Kegg, Richard L.; Schmenk, Myron J.; and Taylor, Ralph C., Jr., 4,370,721, Cl. 364-474.000.

Ciorbaru, Rita: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Ciosek, Bernard M., Jr., to Du Pont de Nemours, E. I., and Company. Shrinkage gauge and method. 4,369,653, Cl. 73-150.00R.

Cipriani, Aldo: *See*—
Carignani, Giancarlo; and Cipriani, Aldo, 4,370,425, Cl. 521-138.000.

Citizen Watch Company Limited: *See*—
Iwakura, Ryoji; Nitta, Tatsuo; and Takahashi, Kazutoshi, 4,370,067, Cl. 368-202.000.
Yamaguchi, Sizuo, 4,370,066, Cl. 368-188.000.

Citrin, Paul S., to Indicon Inc. Manually holdable automatic pipette. 4,369,665, Cl. 73-864.180.

Clark, Earl: *See*—
Uraneck, Carl A.; and Clark, Earl, 4,370,252, Cl. 252-311.000.

Clarke, John B.; and Pitts, Leslie, to Allied Colloids Limited. Dispersing solid carbonaceous material in water. 4,370,429, Cl. 524-60.000.

Clary, Robert M.: *See*—
Small, Edward A.; Edwards, Richard H.; Eufusia, Eugene A.; Clary, Robert M.; and Bergfelt, Nils H., 4,369,876, Cl. 198-460.000.

Clear, Elmer E., to Phillips Petroleum Company. Method using lost circulation material for sealing permeable formations. 4,369,844, Cl. 166-294.000.

Clemens, Jon K.: *See*—
Ross, Michael D.; and Clemens, Jon K., 4,370,672, Cl. 358-312.000.

Clement, Philippe; and Rossi, Jean-Paul, to Societe Industrielle LeSaffre. Preparation of dried baker's yeast. 4,370,420, Cl. 435-256.000.

Cleveland Gear Company: *See*—
Swartz, LeRoy O., 4,370,357, Cl. 427-46.000.

Clubley, Brian G.; Hyde, Thomas G.; and Keenan, John F. E., to Ciba-Geigy AG. Triaryl phosphates. 4,370,281, Cl. 260-966.000.

Clutts, Earnest H. Utility vest. 4,369,526, Cl. 2-51.000.

Coach & Car Equipment Corporation: *See*—
Harder, Arthur J., Jr., 4,369,995, Cl. 296-65.00A.

Cody, John M.; and Weaks, William L. Centrifugal clutch and brake for lawnmower. 4,369,616, Cl. 56-11.300.

Coffron, James W., to Creative Microprocessor Systems. Static stimulus tester for microprocessor systems. 4,370,728, Cl. 364-900.000.

Cohen, Irun R.: *See*—
Lwoff, Andre; Yerushalmi, Aaron; Cohen, Irun R.; Moshe, Gideon B.; and Pennell, Jack, 4,369,777, Cl. 128-200.140.

Cohn, William E., to Zenith Radio Corporation. Doorbell actuated television security system. 4,370,675, Cl. 358-108.000.

Coleman, Clyde F., to RCA Corporation. Video disc player having record retaining mechanism. 4,370,738, Cl. 369-77.000.

Coley, John L. Solar heating and shading window having automatic temperature-responsive damper system. 4,369,766, Cl. 126-429.000.

Colgate-Palmolive Company: *See*—
Gaffar, Abdul, 4,370,314, Cl. 424-54.000.
Joshi, David P., 4,370,250, Cl. 252-135.000.

Colgate, Stirling A. Method of pressurizing and stabilizing rock by periodic and repeated injections of a settable fluid of finite gel strength. 4,370,077, Cl. 405-258.000.

Collins and Aikman Corp.: *See*—
Bauer, Jackson, 4,370,143, Cl. 8-493.000.

Columbus, Richard L., to Eastman Kodak Company. Photographic products including liquid spreading means. 4,370,407, Cl. 430-403.000.

Commissariat a l'Energie Atomique: *See*—
Brethon, Jean-Pierre; Guiho, Jean-Paul; Taniel, Gerard; and Viel, Georges, 4,370,555, Cl. 378-120.000.
Bruel, Michel, 4,370,176, Cl. 148-1.500.

Compagnie de Construction Mecanique Sulzer, French Societe Anonyme: *See*—
Gueissaz, Charles, 4,370,172, Cl. 127-1.000.

Compagnie Francaise des Petroles: *See*—
de Sivry, Bruno; Sudreau, Bernard; Carsac, Claude; Hamon, Jean-Pierre; and Fuzeau, Michel, 4,370,541, Cl. 219-121.0EC.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Levy, Michel; and Poinas, Christian, 4,370,749, Cl. 375-99.000.

Complete Business Services Corp.: *See*—
Zopf, David E., 4,369,950, Cl. 248-632.000.

Composite Container Corporation: *See*—
Bonis, Laszlo J., 4,370,369, Cl. 428-35.000.

Computer Service, Inc.: *See*—
Phillips, Clarence W.; Eiben, Michael R.; and Morgan, Harvey T., Jr., 4,370,707, Cl. 364-200.000.

Consolidated Papers, Inc.: *See*—
Damrau, Wayne A., 4,369,731, Cl. 118-410.000.

Consonni, Pietro: *See*—
Omodei-Sale, Amedeo; Consonni, Pietro; Galliani, Giulio; and Lerner, Leonard, 4,370,336, Cl. 424-269.000.
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, 4,370,337, Cl. 424-269.000.

Contemporary Ocu-Flo, Inc.: *See*—
Rehkopf, Paul G.; and Zdrojkowski, Ronald, 4,369,785, Cl. 128-276.000.

Continental Group, Inc., The: *See*—
Walter, John, 4,369,888, Cl. 215-237.000.

Control Data Corporation: *See*—
Kroft, David, 4,370,710, Cl. 364-200.000.
Smith, James E., 4,370,711, Cl. 364-200.000.

Conway, John W.: *See*—
Bruce, Kenneth E.; Conway, John W.; Lombardo, Ralph M., Jr.; and Tarbox, Bruce H., 4,370,708, Cl. 364-200.000.

Cookson, Alan H.; Fischer, William H.; Yoon, Kue H.; and Meyer, Jeffry R., to Westinghouse Electric Corp. Flexible gas insulated transmission line having regions of reduced electric field. 4,370,511, Cl. 174-14.00R.

Cooley, Richard F., to American Microsystems, Inc. Apparatus for chemical etching of silicon. 4,370,192, Cl. 156-345.000.

Cooper, Donald L.; and Zeidman, Gordon G., to Eastern Company, The. Tool and operator head for a tool-operated lock. 4,369,678, Cl. 81-90.00C.

Cooper, Sidney; and Jacob, Ezekiel J., to Ani-Live Film Service Inc. Dry transfer of electrophotographic images. 4,370,400, Cl. 430-1[illegible]000.

Cordier, Jean: *See*—
Namy, Gerald; and Cordier, Jean, 4,370,154, Cl. 55-309.000.

Cornell Research Foundation, Inc.: *See*—
Hayes, Thomas D.; Kabrick, Randolph M.; and Jewell, William J., 4,370,233, Cl. 210-609.000.

Cornils, Boy: *See*—
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.

Cosand, Albert E.; and de Graaf, Kenneth B., to TRW Inc. Differential sample-and-hold circuit. 4,370,572, Cl. 307-353.000.

Costello, Edward C.; and Simon, David J., to Singer Company, The. Single non-linear converter ladder network having analog switches with digital control. 4,370,642, Cl. 340-347.0SY.

Cotteret, Jean: *See*—
Bugaut, Andree; Thouvenin, Philippe; and Cotteret, Jean, 4,370,142, Cl. 8-407.000.

Courtright, John F.: *See*—
Task, Harry L.; Courtright, John F.; and Salys, Casimer K., 4,370,024, Cl. 350-162.120.

Cousse, Henri: *See*—
Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, 4,370,347, Cl. 424-324.000.

Crane, Patrick E.: *See*—
Chu, James C.; Crane, Patrick E.; D'Agostino, Jack V.; and Schwartz, Paul M., 4,370,659, Cl. 343-772.000.

Creative Microprocessor Systems: *See*—
Coffron, James W., 4,370,728, Cl. 364-900.000.

Creusot-Loire Entreprises: *See*—
Namy, Gerald; and Cordier, Jean, 4,370,154, Cl. 55-309.000.

Crosfield Electronics Limited: *See*—
Isherwood, Jeffrey, 4,369,906, Cl. 226-42.000.

Crossley, Roger, to John Wyeth and Brother Limited. Certain 2-(arylaliphatic thio)-pyridinium compounds. 4,370,477, Cl. 542-413.000.

Crowgey, James L.: *See*—
McCoy, Charles E., Jr.; and Crowgey, James L., 4,370,713, Cl. 364-424.000.

Crowley, Albert T., to RCA Corporation. Phase comparator system. 4,370,653, Cl. 343-6.5LC.

Cruikshank, Susan J.; and Orem, Michael W., to Eastman Kodak Company. Aqueous hydrophilic colloid coating composition containing a combination of anionic surfactants. 4,370,412, Cl. 430-635.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Di Tria, Paolo, 4,370,725, Cl. 364-582.000.

Cuisinarts Research & Development Inc.: *See*—
Williams, James E., 4,369,680, Cl. 83-13.000.

Cummins Engine Company: *See*—
Lauterbach, Jerre F., 4,370,106, Cl. 417-407.000.
Cummins Engine Company, Inc.: *See*—
Kasting, Edward W.; and Glasson, Richard E., 4,369,627, Cl. 60-605.000.
Muntean, George; Wilson, Harry I.; and Gant, Gary L., 4,369,750, Cl. 123-505.000.
Curinier, Jean; and Vandermarliere, Charles, to Les Fils d'Auguste Chomarat & Cie. Method for the manufacture of non-woven textile fabrics. 4,369,554, Cl. 28-101.000.
Cycles Peugeot: *See*—
Perrin, Marc, 4,369,741, Cl. 123-182.000.
D.O.V.E. Equipment Corporation: *See*—
Boettcher, William C., 4,369,896, Cl. 221-75.000.
Daane, Robert A., to W. R. Grace & Co. Preventing air film between web and roller. 4,369,584, Cl. 34-12.000.
D'Agostino, Jack V.: *See*—
Chu, James C.; Crane, Patrick E.; D'Agostino, Jack V.; and Schwartz, Paul M., 4,370,659, Cl. 343-772.000.
Dahlberg, Reinhard, to Licentia Patent-Verwaltungs-GmbH. Solar cell array. 4,370,509, Cl. 136-244.000.
Daikin Kogyo Co., Ltd.: *See*—
Nakamura, Yukiharu; and Kawachi, Shoji, 4,370,436, Cl. 524-322.000.
Dailey, Harold E. Can folding and flattening device. 4,369,699, Cl. 100-156.000.
Daimler-Benz Aktiengesellschaft: *See*—
Budde, Volker, 4,369,707, Cl. 102-202.200.
Gaus, Hermann, 4,369,676, Cl. 74-868.000.
Papenhagen, Dieter; and Komoschinski, Norbert, 4,369,670, Cl. 74-513.000.
Dain, Richard J.; Manning, Gary D.; and Burkin, Alfred R., to Ford & Dain Research Limited. Extractants. 4,370,237, Cl. 210-638.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Kinoshita, Minoru; and Mizuta, Masaji, 4,370,558, Cl. 250-559.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Masuda, Tatsunosuke, 4,370,059, Cl. 356-400.000.
Daito Seiki Company Limited: *See*—
Sugimoto, Tadahiro, 4,369,686, Cl. 83-801.000.
Dakin, Wayne R.: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., 4,370,679, Cl. 358-318.000.
Dalmia Institute of Scientific and Industrial Research: *See*—
Panda, Jajnya D.; and Mahapatra, Santosh K., 4,370,422, Cl. 501-108.000.
Damouth, David E.; Mott, George R.; and Stange, Klaus K., to Xerox Corporation. High speed color apparatus. 4,370,047, Cl. 355-3.0BE.
Damrau, Wayne A., to Consolidated Papers, Inc. Coating apparatus having an internal leveling blade. 4,369,731, Cl. 118-410.000.
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, to Rhone-Poulenc Industries. Binder for manufacturing tufted floor coverings. 4,370,426, Cl. 523-310.000.
Danilewicz, John C.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,370,328, Cl. 424-250.000.
Dannels, W. Andrew; and Bainbridge, Robert W., to Occidental Chemical Corporation. Apparatus for runnerless injection compression molding of thermosetting materials. 4,370,122, Cl. 425-543.000.
Dannels, W. Andrew; and Bainbridge, Robert W., to Occidental Chemical Corporation. Apparatus for runnerless injection compression molding of thermosetting materials. 4,370,123, Cl. 425-543.000.
Danville, Carlos R. Pigmented peroxide and polyester compositions. 4,370,428, Cl. 523-508.000.
Darakjian, Raymond Z.: *See*—
Widman, Lawrence E.; Habeeb, Nasser G.; and Darakjian, Raymond Z., 4,370,136, Cl. 433-217.000.
Darrell, Miklos. Electrified glove. 4,370,696, Cl. 361-232.000.
Das, Balbhadra: *See*—
Melle, Carl A.; McWilliams, Donald E.; and Das, Balbhadra, 4,370,439, Cl. 524-513.000.
Dash, Glen R.; and Straus, Isidor. Circuit for minimizing radiation. 4,370,570, Cl. 307-270.000.
Dassonville, Jacques, to Thomson-CSF. Static high voltage switch usable in a switchable high voltage D.C. generator. 4,370,607, Cl. 323-271.000.
Datafile Limited: *See*—
Pfeffer, George B., 4,369,582, Cl. 33-180.00R.
Daughters, James R. Ink ribbon cartridge pack. 4,369,884, Cl. 206-389.000.
D'Aurora, Joseph R.; and Specht, David F. Electronic crossword puzzle. 4,369,973, Cl. 273-153.00R.
Davenport, Anthony T.: *See*—
Waid, George M.; and Davenport, Anthony T., 4,370,178, Cl. 148-12.00F.
Davey, James W. Transportable fibre optic apparatus for use in a security system. 4,370,020, Cl. 350-96.100.
David, Bernard. Drier for screen printed sheets. 4,369,587, Cl. 34-150.000.
David, Paul E.; and Hyde, Leland M. Heat retriever apparatus. 4,369,918, Cl. 237-55.000.
Davie, William R.: *See*—
Brownell, George L.; Davie, William R.; and Fields, Marvin C., 4,370,240, Cl. 210-673.000.
Davies, Charles A., to Dysan Corporation. Flexible magnetic recording medium with improved reinforcement means. 4,370,689, Cl. 360-135.000.
Davies, William L., to Eaton Laboratories, Inc. Nitrofurantoin dosage form. 4,370,313, Cl. 424-32.000.
Davis, Jack W.; and Blaszuk, Paul R., to United Technologies Corporation. Reflective beam rotator. 4,370,540, Cl. 219-121.0LM.
Davis, Jefferson W., Jr., to United States of America, Energy. Synthesis of amino acids. 4,370,493, Cl. 562-444.000.
de la Fe, Alicia B. Folding stroller for transporting children. 4,369,986, Cl. 280-644.000.
De Rijkslandbouwhogeschool: *See*—
Gundlach, Bertus L., 4,369,652, Cl. 73-149.000.
Dearborn Chemical Company: *See*—
Engstrom, Gary G.; and Bain, Douglas L., 4,369,719, Cl. 110-345.000.
de Buman, Alain; Riva, Aldo; and Sucker, Heinz, to Sandoz Ltd. Method for making suppositories by compression and product of same. 4,369,784, Cl. 128-271.000.
de Carbon, Christian B. Shock absorber including thermostatically controlled fluid flow passage. 4,369,864, Cl. 188-277.000.
DeCaro, Aristide R.; and Nixon, Henry M., to Westinghouse Electric Corp. Filament connector means for electric incandescent lamp. 4,370,589, Cl. 313-315.000.
Dechema Deutsche Gesellschaft fur Chemisches Apparatewesen E V: *See*—
Kirchner, Kurt; and Litzenburger, Wolfgang, 4,370,306, Cl. 423-220.000.
de Graaf, Kenneth B.: *See*—
Cosand, Albert E.; and de Graaf, Kenneth B., 4,370,572, Cl. 307-353.000.
Deguchi, Yukichi; Noguchi, Yukio; and Kobayashi, Hiroaki, to Toray Industries, Inc. Polyphenylenesulfide sheet-like material. 4,370,469, Cl. 528-388.000.
DeGuia, Andrea A., to Celanese Corporation. Polyester blend compositions exhibiting suppression of transesterification. 4,370,438, Cl. 524-412.000.
Degussa AG: *See*—
Junkermann, Helmut; and Kruger, Horst, 4,370,241, Cl. 210-759.000.
Deiner, Hans, to Ciba-Geigy Corporation. Process for the production of an ester mixture, emulsions containing this mixture, and the application thereof. 4,370,366, Cl. 427-389.900.
Dell, Joseph C. Safety-vac lawn mower blade. 4,369,618, Cl. 56-295.000.
Delta Systems, Inc.: *See*—
Howard, William A., 4,369,745, Cl. 123-198.0DC.
De Luca, Robert, to Johnson & Johnson Dental Products Company. Low silver dental amalgam alloy composition. 4,370,165, Cl. 106-35.000.
Demmer, Wilhelm: *See*—
Bieg, Hartmut; Jonas, Hans; Rosswurm, Heinz; Demmer, Wilhelm; and Dobel, Ludwig, 4,369,683, Cl. 83-157.000.
Dencs, Bela; Ormos, Zoltan; and Pataki, Karoly, to Mta Muszaki Kemiai Kutato Intezet. Method and apparatus for the recovery of the solid material content of solutions and/or suspensions as granules in a gas fluidized bed. 4,370,198, Cl. 159-48.100.
DeNet, Robert W.: *See*—
Haviv, Fortuna; DeNet, Robert W.; and Boulanger, William A., 4,370,339, Cl. 424-273.00P.
Denham, Ernest J.: *See*—
Barker, William I.; and Denham, Ernest J., 4,370,185, Cl. 156-565.000.
Denzinger, Walter: *See*—
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.
Depetris, Norbert; and Bovis, Claude, to Chloe-Chimie. Polyurethane-base material suitable for use for making fire arresting walls. 4,370,445, Cl. 524-742.000.
Dermik Laboratories: *See*—
Packman, Albert M., 4,370,325, Cl. 424-245.000.
Desanta, Simon, to Kusch & Co., Sitzmohelwerke KG. Chair. 4,369,997, Cl. 297-68.000.
Deschamps, Bernard: *See*—
Chielens, Alain; Boussekey, Bernard; and Deschamps, Bernard, 4,370,128, Cl. 432-115.000.
de Sivry, Bruno; Sudreau, Bernard; Carsac, Claude; Hamon, Jean-Pierre; and Fuzeau, Michel, to Compagnie Francaise des Petroles. Electron beam chamber for butt welding pipes. 4,370,541, Cl. 219-121.0EC.
DeSoto, Inc.: *See*—
Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,370,441, Cl. 524-539.000.
Detain, Monique: *See*—
Ceintrey, Claude; and Detain, Monique, 4,370,397, Cl. 430-10.000.
deVries, Louis; and King, John M., to Chevron Research Company. Antioxidant combinations of molybdenum complexes and aromatic amine compounds. 4,370,246, Cl. 252-46.400.
Diamond Shamrock Corporation: *See*—
Solomon, Frank, 4,370,284, Cl. 264-42.000.
Dickson, William D.: *See*—
McClain, James E.; Dickson, William D.; and Scott, Howard L., 4,370,098, Cl. 417-18.000.
Didier-Werke AG: *See*—
Palz, Helmut, 4,369,954, Cl. 266-139.000.
Diebold Incorporated: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, 4,370,006, Cl. 312-215.000.

diga - die gasheizung GmbH: *See*—
Boer, Hubert, 4,370,364, Cl. 427-238.000.
Dill, Ken A.; Zimm, Bruno H.; and Shafer, Richard H., to University of California, The Regents of the. Device for and a method to separate orientable or deformable particles. 4,370,242, Cl. 210-787.000.
Dinkel, Rolf, to Lonza Ltd. Process for the production of 3-picoline. 4,370,481, Cl. 546-251.000.
Discovision Associates: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., 4,370,679, Cl. 358-318.000.
Disselnkotter, Hans: *See*—
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,370,280, Cl. 260-465.600.
Ditchfield, Neville J. Coil package with hub forming means contained therein. 4,369,881, Cl. 206-225.000.
Di Tria, Paolo, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and circuit arrangement for automatic signal-level control. 4,370,725, Cl. 364-582.000.
Diversified Products Corporation: *See*—
Silberman, Ira J.; and James, Calvin E., Sr., 4,369,966, Cl. 272-62.000.
Dobel, Ludwig: *See*—
Bieg, Hartmut; Jonas, Hans; Rosswurm, Heinz; Demmer, Wilhelm; and Dobel, Ludwig, 4,369,683, Cl. 83-157.000.
Dr. C. Otto & Comp. G.m.b.H: *See*—
Schulz, Peter, 4,370,363, Cl. 427-230.000.
Dr. Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,369,578, Cl. 33-1.0PT.
Dr. Karl Thomae Gesellshaft mit beschrankter Haftung: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,370,312, Cl. 424-1.500.
Doersom, Mary E.: *See*—
Sweigart, Raymond H.; and Doersom, Mary E., 4,370,593, Cl. 313-414.000.
Doi, Kunihiro; Takeyama, Tetsu; and Azuma, Kenkoku, to Mitsubishi Denki Kabushiki Kaisha. Dry deodorizing apparatus. 4,370,301, Cl. 422-122.000.
Dola, Frank P., to AMP Incorporated. Slotted plate terminal renewable as spade terminal. 4,370,009, Cl. 339-31.00R.
Dolan Corrugated Containers Limited: *See*—
Bunnell, Thomas K., 4,369,682, Cl. 83-112.000.
Dollman, David Y., to Amchem Products, Inc. Composition and method for acid cleaning of aluminum surfaces. 4,370,173, Cl. 134-3.000.
Dombrowski, Philip: *See*—
Hein, James R.; Herr, Wayne T., Sr.; Niemiec, John J.; and Dombrowski, Philip, 4,369,982, Cl. 280-47.13R.
Dominguez-Abedo, Carlos; and Guzman-Bofill, Carlos, to Hylsa, S.A. Method for the gaseous reduction of iron ore to sponge iron. 4,370,162, Cl. 75-90.00R.
Donaghue, Paul F.; Love, Thomas L.; Mitchell, Kenneth A. W.; and Pitt, Maxwell G., to ICI Australia Limited. Method for mixing and placing explosive compositions. 4,369,689, Cl. 86-20.00C.
Donaldson, Jay W., to Rockwell International Corporation. Electromagnetic interference. 4,370,515, Cl. 174-35.00R.
Doniger, Jerry; Kirchhein, Albert T.; and Reynolds, Gibson, to Bendix Corporation, The. Controller for a dual servo system. 4,370,706, Cl. 364-184.000.
Donley, William B., to General Motors Corporation. Reduced source capacitance ring-shaped IGFET load transistor in mesa-type integrated circuit. 4,370,669, Cl. 357-23.000.
Donnelly, Donald E.; and Maney, Francis J., to Emerson Electric Co. Control system for blue-flame oil burner. 4,370,125, Cl. 431-66.000.
Doorakian, George A.: *See*—
Burton, Bruce L.; and Doorakian, George A., 4,370,461, Cl. 528-45.000.
Whiteside, Ross C., Jr.; Gist, Adolphus V.; and Doorakian, George A., 4,370,465, Cl. 528-104.000.
Dopp, Robert B., to Ray-O-Vac Corporation. Method for manufacturing cells utilizing centrifuging techniques. 4,369,568, Cl. 29-623.200.
Dorius, Edwin J.: *See*—
Norris, Amos; and Dorius, Edwin J., 4,369,778, Cl. 128-205.130.
Dow Chemical Company, The: *See*—
Burton, Bruce L.; and Doorakian, George A., 4,370,461, Cl. 528-45.000.
Frudd, Francis D., 4,370,215, Cl. 204-242.000.
Oakes, Billy D., 4,370,256, Cl. 252-391.000.
Spangenberg, Stanley F.; Finley, Arlington L.; and Searson, D. James, 4,370,216, Cl. 204-243.00R.
Whiteside, Ross C., Jr.; Gist, Adolphus V.; and Doorakian, George A., 4,370,465, Cl. 528-104.000.
Zabrocki, Vincent S.; and Bussey, Marlin G., 4,370,378, Cl. 428-339.000.
Dow Corning Corporation: *See*—
Plueddemann, Edwin P., 4,370,255, Cl. 252-389.00A.
Ziemelis, Maris J., 4,370,160, Cl. 71-117.000.
Dressler, Mirko; Formanek, Vojtech; Michl, Vaclav; and Stejskal, Miroslav, to Vyzkumny ustav lesniho hospodarstvi a myslivosti. Cutting tool for tree delimbing device. 4,369,824, Cl. 144-343.000.
Dronet, Jean-Marc, to Societe d'Application Plastique Mecanique et Electronique. Arrangement for introducing banderoles or strips into receptacles. 4,370,118, Cl. 425-305.100.
Droz, Serge-Andre. Alarm device for a door, automatically switched off during a licit access. 4,370,644, Cl. 340-528.000.
Dualmatic Manufacturing Company: *See*—
Fleitas, Arthur M., 4,369,868, Cl. 192-36.000.
Dubeck, Michael: *See*—
Hargis, Duane C.; and Dubeck, Michael, 4,370,507, Cl. 568-902.000.
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, to Thomson-CSF. Illuminating device for providing an illumination beam with adjustable distribution of intensity and a pattern-transfer system comprising such a device. 4,370,026, Cl. 350-163.000.
Duddles, Allen L.; and Toomey, Daniel G., to Motorola Inc. RF Package including RF shielding for a multiple PC board. 4,370,700, Cl. 361-424.000.
Dungs, Horst: *See*—
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,370,202, Cl. 202-228.000.
Dunn, Robert E.: *See*—
Bourgraf, Elroy E.; Dunn, Robert E.; and Vance, Ronald D., 4,369,985, Cl. 280-641.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bond, William B., 4,370,375, Cl. 428-229.000.
Brake, Loren D., 4,370,503, Cl. 564-474.000.
Bryan, Paul J.; and Morse, Daniel R., 4,369,708, Cl. 102-202.130.
Byer, Richard J., 4,370,411, Cl. 430-596.000.
Ciosek, Bernard M., Jr., 4,369,653, Cl. 73-150.00R.
Gangal, Subhash V.; and Olson, Allan H., 4,370,376, Cl. 428-241.000.
Levitt, George, 4,370,479, Cl. 544-278.000.
Levitt, George; and Petersen, Wallace C., 4,370,480, Cl. 544-320.000.
Livingston, Richard D., 4,370,061, Cl. 366-85.000.
Mahr, Tibor G.; and Subramanian, Pallatheri M., 4,370,212, Cl. 204-159.140.
Schweitzer, Francis E., 4,370,427, Cl. 523-400.000.
Siemionko, Roger K., 4,370,466, Cl. 528-190.000.
Spencer, Dudley W. C., 4,369,779, Cl. 128-213.00A.
Yunan, Malak E., 4,369,688, Cl. 86-1.00R.
Duskin Franchise Kabushiki Kaisha: *See*—
Mori, Yasuyuki; Nishimura, Haruo; and Sugahara, Yoshikazu, 4,370,300, Cl. 422-108.000.
Dvorak, Neil E.: *See*—
Huffman, Stanley S.; Neel, Alan F.; Swartout, Christopher A.; and Dvorak, Neil E., 4,370,723, Cl. 364-483.000.
Dynamit Nobel AG: *See*—
Kotzach, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,370,204, Cl. 203-39.000.
Dynes, Robert C.; and Mochel, John M., to Bell Telephone Laboratories, Incorporated. Metal-semiconductor thermal sensor. 4,370,640, Cl. 338-25.000.
Dysan Corporation: *See*—
Davies, Charles A., 4,370,689, Cl. 360-135.000.
Eastern Company, The: *See*—
Cooper, Donald L.; and Zeidman, Gordon G., 4,369,678, Cl. 81-90.00C.
Eastman, Alan D.; and Kolts, John H., to Phillips Petroleum Company. Oxidative dehydrogenation catalyst. 4,370,259, Cl. 252-437.000.
Eastman Kodak Company: *See*—
Columbus, Richard L., 4,370,407, Cl. 430-403.000.
Cruikshank, Susan J.; and Orem, Michael W., 4,370,412, Cl. 430-635.000.
Jackson, David R.; and Rushing, Allen J., 4,369,732, Cl. 118-681.000.
Eaton Corporation: *See*—
Aschenbach, Louis F., 4,370,528, Cl. 200-6.0BB.
Eaton Laboratories, Inc.: *See*—
Davies, William L., 4,370,313, Cl. 424-32.000.
Eberly, Paul E., Jr.; Mauldin, Charles H.; and Baird, William C., Jr., to Exxon Research and Engineering Co. Reforming with multimetallic catalysts. 4,370,224, Cl. 208-139.000.
Ebi, Yutaka: *See*—
Horike, Masanori; Yoshiba, Yutaka; and Ebi, Yutaka, 4,370,664, Cl. 346-75.000.
Eckberg, Richard P.: *See*—
Hayes, Susan E.; and Eckberg, Richard P., 4,370,358, Cl. 427-54.100.
Eckenrode, Lewis A. Radiator vent valve. 4,369,810, Cl. 137-556.000.
Eckert, Hansdieter: *See*—
Schmidt, Sylvia; Eckert, Hansdieter; Holzinger, Wolfgang; and Holle, Dietrich, 4,370,200, Cl. 162-210.000.
Eckhardt, Dietrich: *See*—
Sabet, Huschang; and Eckhardt, Dietrich, 4,370,109, Cl. 418-34.000.
Econ Company: *See*—
Russell, Benjamin; and Scott, Jerry W., 4,370,153, Cl. 55-304.000.
Edison, David M.: *See*—
Hummert, George T.; Moser, Thomas D.; and Edison, David M., 4,370,717, Cl. 364-436.000.
Edleblute, Calvin M.: *See*—
Gise, Glenn A.; and Edleblute, Calvin M., 4,369,577, Cl. 30-276.000.
Edwards, Charles C. Spinal fixation device and method. 4,369,769, Cl. 128-69.000.
Edwards, Richard H.: *See*—
Small, Edward A.; Edwards, Richard H.; Eufusis, Eugene A.; Clary, Robert M.; and Bergfelt, Nils H., 4,369,876, Cl. 198-460.000.
Egly, Robert A.; and Sullivan, Patrick, to Egly, Robert A. Magnetic disk storage case. 4,369,879, Cl. 206-45.180.
Ehmke, Edward L., to Motorola, Inc. Battery saver for a tone coded signalling system. 4,370,753, Cl. 455-36.000.

Eiben, Michael R.: *See*—
Phillips, Clarence W.; Eiben, Michael R.; and Morgan, Harvey T., Jr., 4,370,707, Cl. 364-200.000.

Eiken Chemical Co., Ltd.: *See*—
Iida, Tamotsu; Enomoto, Seiji; and Kimura, Michiya, 4,370,419, Cl. 435-301.000.

Ekkerink, Pierre J., to Vredestein N.V. Mattress assembly. 4,369,535, Cl. 5-481.000.

Ela, Roger B.: *See*—
McDonald, Donald C.; Ela, Roger B.; and Pignataro, Dominic F., 4,370,693, Cl. 361-145.000.

Elder Pharmaceuticals, Inc.: *See*—
Kaufman, Kurt D., 4,370,344, Cl. 424-279.000.

Electrolux GmbH: *See*—
Michael, Harald R., 4,370,227, Cl. 210-170.000.

Elias, Jiri: *See*—
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Esner, Stanislav; Skoda, Stanislav; and Janousek, Jan, 4,369,620, Cl. 57-263.000.

Ellouz, Fabrielle: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Elmore, Glenn V.: *See*—
Abolafia, Oscar R.; Ameen, Joseph G.; and Elmore, Glenn V., 4,370,197, Cl. 156-659.100.

Elson, Lloyd C. Article dropping kite. 4,369,939, Cl. 244-155.00R.

Eltra Corporation: *See*—
Kern, Calvin V., 4,369,666, Cl. 74-7.00R.

Emerson Electric Co.: *See*—
Donnelly, Donald E.; and Maney, Francis J., 4,370,125, Cl. 431-66.000.

Emery Industries, Inc.: *See*—
Kinsman, Donald V.; and Luken, Clement H., Jr., 4,370,273, Cl. 260-404.500.

Emery, Merton D., to Harbor Industries, Inc. Merchandizing rack. 4,369,887, Cl. 211-49.00D.

Emhart Industries, Inc.: *See*—
Perry, Leroy A.; and Scott, Charles E., 4,370,566, Cl. 307-141.000.

Endo, Hiroshi, to Nissan Motor Company, Limited. Plasma ignition system. 4,369,758, Cl. 123-620.000.

Energy Conversion Devices, Inc.: *See*—
Izu, Masatsugu; Barnard, Timothy J.; and Gattuso, David A., 4,369,730, Cl. 118-723.000.

Engineered Products Company: *See*—
Nelson, Joseph N., 4,369,728, Cl. 116-276.000.

Engstrom, Gary G.; and Bain, Douglas I., to Dearborn Chemical Company. Vermiculite as a deposit modifier in coal fired boilers. 4,369,719, Cl. 110-345.000.

Enokita, Ryuzo: *See*—
Arai, Mamoru; Haneishi, Tatsuo; Nakajima, Mutsuo; Torikata, Akio; and Enokita, Ryuzo, 4,370,266, Cl. 260-112.50R.

Enomoto, Seiji: *See*—
Iida, Tamotsu; Enomoto, Seiji; and Kimura, Michiya, 4,370,419, Cl. 435-301.000.

Eppinger, Mariao: *See*—
Eppinger, Otto; and Eppinger, Mariao, 4,369,718, Cl. 110-163.000.

Eppinger, Otto; and Eppinger, Mariao. Shut-off system for flue gas conduits or air intake conduits in oil and gas fire systems. 4,369,718, Cl. 110-163.000.

Eriksson, Gunno; and Nilarp, Anders, to Asea Aktiebolag. Semiconductor device. 4,370,671, Cl. 357-79.000.

Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Encapsulated angle measuring apparatus. 4,369,578, Cl. 33-1.0PT.

Ernst Leitz Wetzlar GmbH: *See*—
Lenz, Karl J., 4,369,581, Cl. 33-169.00C.

Ertl, Franz: *See*—
Van Bouwel, Leo; Geyken, Erwin; Ertl, Franz; and Fleck, Adolf, 4,370,046, Cl. 354-324.000.

ESCO Manufacturing Company: *See*—
McClain, James E.; Dickson, William D.; and Scott, Howard L., 4,370,098, Cl. 417-18.000.

Esner, Stanislav: *See*—
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Esner, Stanislav; Skoda, Stanislav; and Janousek, Jan, 4,369,620, Cl. 57-263.000.

Estes, R. Ray: *See*—
Fisher, E. Eugene; Estes, R. Ray; Lokken, Orvin D.; and Paquette, Elmer G., 4,370,350, Cl. 426-5.000.

Estingoy, Henri L. Method and apparatus for knitting hollow articles. 4,369,638, Cl. 66-148.000.

Ethyl Corporation: *See*—
Hargis, Duane C.; and Dubeck, Michael, 4,370,507, Cl. 568-902.000.
Stahly, Barbara C.; and Stahly, G. P., 4,370,278, Cl. 260-465.00E.

Ethyl Products Company: *See*—
Cianciolo, Cosmo J.; Snyder, John R.; and King, Roderick V., 4,369,643, Cl. 72-75.000.
Ostrowsky, Efrem M., 4,369,889, Cl. 215-246.000.

Euerle, Karl. Back-pressure valve for heating installations. 4,369,809, Cl. 137-543.190.

Eufusia, Eugene A.: *See*—
Small, Edward A.; Edwards, Richard H.; Eufusia, Eugene A.; Clary, Robert M.; and Bergfelt, Nils H., 4,369,876, Cl. 198-460.000.

Evans, David G.: *See*—
Skelly, James K.; Evans, David G.; and Becker, Carl, 4,370,144, Cl. 8-501.000.

Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., to Imperial Chemical Industries Limited. Process for preparing freeze-dried liposome compositions. 4,370,349, Cl. 424-365.000.

Everts, Robert G., to Pison Powered Products a division of RW Technologies, Inc. Connecting rod for internal combustion engine. 4,369,742, Cl. 123-193.00P.

Exxon Research and Engineering Co.: *See*—
Agarwal, Pawan K.; and Lundberg, Robert D., 4,370,432, Cl. 524-216.000.
Bearden, Roby; and Stuntz, Gordon F., 4,370,220, Cl. 208-108.000.
Eberly, Paul E., Jr.; Mauldin, Charles H.; and Baird, William C., Jr., 4,370,224, Cl. 208-139.000.
Ostyn, Marcel A., 4,370,247, Cl. 252-46.700.

Ezoe, Mitsuhiko, to Nissan Motor Co., Ltd. Plasma jet ignition system for internal combustion engine. 4,369,756, Cl. 123-620.000.

F. L. Smidth & Co.: *See*—
Rasmussen, Ole S.; and Lund, Peter, 4,369,926, Cl. 241-18.000.

F & P Production Co., Inc.: *See*—
Freeman, Ronnie D.; and Payne, Elton R., 4,369,839, Cl. 166-53.000.

Fabian, Wolfgang: *See*—
Bock, Gustav; and Fabian, Wolfgang, 4,370,270, Cl. 260-245.870.

Fahmy, Moustafa N. I. Broadband elliptic sheet antenna. 4,370,660, Cl. 343-795.000.

Fairchild Camera and Instrument Corporation: *See*—
Chan, John Y., 4,370,737, Cl. 365-203.000.

Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, to Ruhrchemie AG. Process for the manufacture of polyolefins. 4,370,458, Cl. 526-138.000.

Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plau, Bernard; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. Oxacephalosporins. 4,370,478, Cl. 542-427.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,370,474, Cl. 536-6.400.

Farr, Glyn P. R.; and Matthews, Colin S., to Lucas Industries Limited. Internal shoe drum brakes for vehicles. 4,369,863, Cl. 188-106.00A.

Fasco, Rudolph. Anchor. 4,369,727, Cl. 114-297.000.

Fauland, Erich: *See*—
Kampe, Wolfgang; Thiel, Max; Fauland, Erich; Bicker, Uwe; and Hebold, Gottfried, 4,370,323, Cl. 424-244.000.

Faulkner, D. John, to University of California, The Regents of the. Sceptrin an antimicrobial agent from *Agelas sceptrum*. 4,370,484, Cl. 548-316.000.

Faulkner, Dennis T.; Glennon, Timothy F.; and Markunas, Albert L., to Sundstrand Corporation. Compressor load control for an auxiliary power unit. 4,370,560, Cl. 290-40.00C.

Favereau, Pierre: *See*—
Franclet, Andre; and Favereau, Pierre, 4,369,599, Cl. 47-74.000.

Fawn Engineering Corp.: *See*—
Offutt, Elmer B.; Babich, Edward; and Gillett, William G., 4,369,897, Cl. 221-227.000.

FDX Associates, L.P.: *See*—
Bussard, Robert W., 4,370,295, Cl. 376-133.000.
Bussard, Robert W., 4,370,296, Cl. 376-133.000.

Federal Paper Board Company, Inc.: *See*—
Langston, Joseph, Jr.; and Murray, Robert J., 4,369,914, Cl. 229-33.000.

Fegley, Richard F.; and Kiss, Steven R., to Paco Winders, Inc. Paper tube cut off saw. 4,370,140, Cl. 493-289.000.

Fenstermaker, Roger W., to Phillips Petroleum Company. Engine performance operating on fieid gas as engine fuel. 4,370,150, Cl. 55-16.000.

Ferguson, Robert C., to Phillips Petroleum Company. Purification of hydrocarbon streams. 4,370,236, Cl. 210-634.000.

Fetter, Linus A.; Howard, Richard E.; Hu, Evelyn L.; and Jackel, Lawrence D., to Bell Telephone Laboratories, Incorporated. Fabrication technique for junction devices. 4,370,359, Cl. 427-63.000.

Field Electronics Inc.: *See*—
McCarty, John J.; and Meyer, Kerry L., 4,369,895, Cl. 221-3.000.

Fields, Marvin C.: *See*—
Brownell, George L.; Davie, William R.; and Fields, Marvin C., 4,370,240, Cl. 210-673.000.

Fildes, Francis J. T.: *See*—
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., 4,370,349, Cl. 424-365.000.

Finch, Harvey E.; and Trapanese, Salvatore P., to FPS Development Partnership. Olive oil recovery. 4,370,274, Cl. 260-412.300.

Finley, Arlington L.: *See*—
Spangenberg, Stanley F.; Finley, Arlington L.; and Searson, D. James, 4,370,216, Cl. 204-243.00R.

Firestone Tire & Rubber Company, The: *See*—
Charek, Leonard T., 4,369,983, Cl. 280-81.00A.

Fischer, Hermann: *See*—
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.

Fischer, James R.: *See*—
McCloskey, Chester M.; Fischer, James R.; and Scott, Leonard F., 4,370,485, Cl. 548-404.000.

Fischer, William H.: *See*—
Cookson, Alan H.; Fischer, William H.; Yoon, Kue H.; and Meyer, Jeffry R., 4,370,511, Cl. 174-14.00R.

Fisher, E. Eugene; Estes, R. Ray; Lokken, Orvin D.; and Paquette, Elmer G., to Wm. Wrigley Jr. Company. Chewing gum method. 4,370,350, Cl. 426-5.000.

Fitts, Robert W., to RCA Corporation. Image intensifier tube having an internal alkali baffle. 4,370,586, Cl. 313-102.000.

Fives-Cail Babcock: *See*—
Chielens, Alain; Boussekey, Bernard; and Deschamps, Bernard, 4,370,128, Cl. 432-115.000.

Flagg, Rodger H. Apparatus for salvage compacting. 4,369,700, Cl. 100-215.000.

Flanders, Dale C.: *See*—
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., 4,370,194, Cl. 156-643.000.

Flasza, Michael D.: *See*—
Johnson, Fred D.; Flasza, Michael D.; and Bretl, Wayne E., 4,370,674, Cl. 358-74.000.

Fleck, Adolf: *See*—
Van Bouwel, Leo; Geyken, Erwin; Ertl, Franz; and Fleck, Adolf, 4,370,046, Cl. 354-324.000.

Fleitas, Arthur M., to Dualmatic Manufacturing Company. Automatic clutch for four-wheel drive vehicles. 4,369,868, Cl. 192-36.000.

Fler, Jack P., to Jacmorr Manufacturing Limited. Sliding drawer suspension. 4,370,007, Cl. 312-334.000.

Fluck, David W., to PACCAR Inc. Sun visor system for trucks. 4,369,996, Cl. 296-97.00K.

Fluid Energy Systems Corporation: *See*—
Nagely, John L., 4,370,110, Cl. 418-132.000.

FMC Corporation: *See*—
Liao, Hsiang P.; Mohr, Richard A.; and Start, John F., 4,370,251, Cl. 252-186.420.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Redirecting device for safety belts. 4,369,931, Cl. 242-107.000.

Fohlmeister, Hans D.: *See*—
Heuer, Helmut; Schapsmeier, Wilhelm; and Fohlmeister, Hans D., 4,369,877, Cl. 198-509.000.

Ford & Dain Research Limited: *See*—
Dain, Richard J.; Manning, Gary D.; and Burkin, Alfred R., 4,370,237, Cl. 210-638.000.

Ford Motor Company: *See*—
Lemieux, George E., 4,369,867, Cl. 192-4.00A.
Lewis, Charles W., 4,369,677, Cl. 74-869.000.

Foremost-McKesson, Inc.: *See*—
Weaver, Robert F., 4,370,084, Cl. 414-292.000.

Formanek, Vojtech: *See*—
Dressler, Mirko; Formanek, Vojtech; Michl, Vaclav; and Stejskal, Miroslav, 4,369,824, Cl. 144-343.000.

Forster, Franz; and Stein, Harald, to Linde Aktiengesellschaft. Regulating devices for hydrostatic drive units. 4,370,100, Cl. 417-218.000.

Forster, Ingrid: *See*—
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.

Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Control device for remote adjustments of ink zones in printing presses. 4,369,706, Cl. 101-365.000.

Fosdick, Robert E., to Tracor, Inc. Computer emulator with three segment microcode memory and two separate microcontrollers for operand derivation and execution phases. 4,370,709, Cl. 364-200.000.

Foseco International Limited: *See*—
Generali, Marcel, 4,369,830, Cl. 164-137.000.

Foster, Donald D.: *See*—
Magers, Wallace F.; and Foster, Donald D., 4,369,899, Cl. 222-153.000.

Foster, John S., Jr.; Wilson, James R.; and McDonald, Charles A., Jr., to United States of America, Energy. Electric generator. 4,370,576, Cl. 310-10.000.

Foster, Robert D.; and Weeden, Frank G. Compacting press with expandable body. 4,370,120, Cl. 425-405.00H.

Fournier, Paul J. E.; and Kunz, Guenter O., to Aeroquip Corporation. Convoluted hose fitting. 4,369,992, Cl. 285-256.000.

Fox, Gary R., to Wadsworth-Greenwood Corporation. Apparatus for obtaining uniform solid colors or variegated patterns in fabrics. 4,369,640, Cl. 68-205.00R.

Foxcroft Associates: *See*—
Robinson, Thomas C.; and Kitrilakis, Sotiris, 4,369,530, Cl. 3-1.700.

FPS Development Partnership: *See*—
Finch, Harvey E.; and Trapanese, Salvatore P., 4,370,274, Cl. 260-412.300.

Francis, Gordon K., to Bell Telephone Laboratories, Incorporated. Variable rate timing circuit. 4,370,525, Cl. 179-16.00A.

Francis, Leonard J.: *See*—
Hutter, Harold G.; and Francis, Leonard J., 4,370,015, Cl. 339-97.00P.

Franclet, Andre; and Favereau, Pierre, to Association Foret-Cellulose. Cultivation balls. 4,369,599, Cl. 47-74.000.

Franken, Jeffrey J.; Gladney, Walter W.; and Yeich, William R., to Western Electric Co., Inc. Compacting particulate material into a body. 4,370,294, Cl. 264-571.000.

Frankie, Thomas T. Hot-air distribution system. 4,369,626, Cl. 60-517.000.

Franz, James H., Jr.; and Jones, Stanley W., to Westinghouse Electric Corp. Shunt field control apparatus and method. 4,370,603, Cl. 318-523.000.

Frazer, Spencer; and Soibelman, Steven P., to Kind Horn Company, The. Loudspeaker and horn combination. 4,369,857, Cl. 181-159.000.

Frazier, Lawrence M.; and Lewis, Benjamin G., to General Dynamics, Pomona Division. Use of bistatic radar system for determining distance between airborne aircraft. 4,370,656, Cl. 343-112.00D.

Freeman, Ronnie D.; and Payne, Elton R., to F & P Production Co., Inc. Casing vacuum system. 4,369,839, Cl. 166-53.000.

Frei, Bernhard: *See*—
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,369,932, Cl. 242-107.40A.

Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., to Amchem Products, Inc. Coating solution for metal surfaces. 4,370,177, Cl. 148-6.270.

Friedman, Harry G., to Medtronic, Inc. Body implantable electrode. 4,369,791, Cl. 128-419.00P.

Friedrich, Ludwig: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,369,706, Cl. 101-365.000.

Frinak, Stanley: *See*—
Bicher, James I.; and Frinak, Stanley, 4,369,795, Cl. 128-736.000.

Fritzsche, Alfred K.: *See*—
Opersteny, Edward J.; and Fritzsche, Alfred K., 4,369,605, Cl. 51-319.000.

Frudd, Francis D., to Dow Chemical Company, The. Renewable electrode assembly. 4,370,215, Cl. 204-242.000.

Fuchikami, Takamasa: *See*—
Ojima, Iwao; and Fuchikami, Takamasa, 4,370,504, Cl. 568-454.000.

Fuerle, Gerard A. Payment responsive data display network. 4,370,649, Cl. 340-825.350.

Fuji Photo Film Co., Ltd.: *See*—
Ohara, Yuji; and Ohnishi, Masahiro, 4,370,667, Cl. 346-108.000.
Sato, Masamichi; Matsumoto, Kenji; and Seki, Kazuhisa, 4,370,025, Cl. 350-166.000.
Sato, Masamichi; Matsumoto, Kenji; and Naito, Shunichi, 4,370,396, Cl. 430-7.000.
Tachikawa, Hiromichi; Takahashi, Yohonosuke; Ishii, Kazuo; Ikeda, Tomoaki; and Shinozaki, Fumiaki, 4,370,404, Cl. 430-302.000.

Fuji Photo Optical Co., Ltd.: *See*—
Sato, Masamichi; Matsumoto, Kenji; and Seki, Kazuhisa, 4,370,025, Cl. 350-166.000.
Sato, Masamichi; Matsumoto, Kenji; and Naito, Shunichi, 4,370,396, Cl. 430-7.000.

Fuji Xerox Co., Ltd.: *See*—
Fuse, Mario; and Takenouchi, Mutsuo, 4,370,360, Cl. 427-76.000.

Fujiki, Masao: *See*—
Shiraishi, Fumitake; Fujioka, Masahiko; and Fujiki, Masao, 4,370,687, Cl. 360-98.000.

Fujimatsu, Wataru: *See*—
Iijima, Toshifumi; Fujimatsu, Wataru; and Onodera, Kaoru, 4,370,410, Cl. 430-505.000.

Fujimoto, Katsuhiko: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Iwasaki, Akira; and Fujimoto, Katsuhiko, 4,369,852, Cl. 180-148.000.

Fujioka, Masahiko: *See*—
Shiraishi, Fumitake; Fujioka, Masahiko; and Fujiki, Masao, 4,370,687, Cl. 360-98.000.

Fujisaki, Kazuuki: *See*—
Yagi, Naoki; Kim, Kwang Y.; Nakaji, Tarushige; and Fujisaki, Kazuuki, 4,370,353, Cl. 426-570.000.

Fujisawa, Norio: *See*—
Andow, Fumio; and Fujisawa, Norio, 4,370,571, Cl. 307-353.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, 4,370,332, Cl. 424-258.000.
Sato, Yoshinari, 4,370,334, Cl. 424-266.000.
Takaya, Takao; and Tozuka, Zenzaburo, 4,370,326, Cl. 424-246.000.
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,370,340, Cl. 424-274.000.

Fujishima, Nobuiti; Nakano, Hideharu; and Wada, Yukio, to Matsushita Electric Works, Ltd. Hair dryer. 4,370,544, Cl. 219-370.000.

Fujita, Saburo: *See*—
Kazama, Takahiko; Okamura, Yuji; and Fujita, Saburo, 4,370,291, Cl. 264-210.700.

Fujitsu Fanuc Limited: *See*—
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,370,704, Cl. 364-171.000.
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,370,705, Cl. 364-184.000.
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,370,722, Cl. 364-474.000.
Kawada, Shigeki; and Ishida, Hiroshi, 4,370,614, Cl. 324-173.000.

Fujitsu Limited: *See*—
Kamei, Seisuke; Nabetani, Hideo; and Kinoshita, Ryohei, 4,370,533, Cl. 200-340.000.
Minamitani, Eiji; Ozawa, Kiyoo; and Yokoso, Takashi, 4,370,742, Cl. 370-58.000.
Nawata, Yoshiaki; Nakatani, Yasutaka; and Nakazawa, Haruki, 4,370,670, Cl. 357-36.000.
Ogawa, Tadao; and Yamaguchi, Nobuhide, 4,370,624, Cl. 330-294.000.
Shinoda, Tsutae; Yoshikawa, Kazuo; and Miyashita, Yoshinori, 4,370,599, Cl. 315-217.000.
Takahashi, Yukio, 4,370,736, Cl. 365-155.000.

Fujiwara, Yasuo: *See*—
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,370,415, Cl. 435-119.000.

Fukatsu, Shunzo: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Kawamura, Kenji; and Fukatsu, Shunzo, 4,370,318, Cl. 424-177.000.

Fukahara, Toru; and Utagawa, Ken, to Nippon Kogaku K.K. Focus detecting device. 4,370,551, Cl. 250-201.000.

Fukuma, Daizo: *See*—
Okamoto, Hisao; and Fukuma, Daizo, 4,369,710, Cl. 102-289.000.

Fukumoto, Terumichi: *See*—
Wakabayashi, Noriaki; Fukumoto, Terumichi; and Ueda, Nobuhiro, 4,370,577, Cl. 310-12.000.

Fukuyama, Hiroomi; and Isobe, Shinichi, to Fujitsu Fanuc Limited. Feed speed control system. 4,370,704, Cl. 364-171.000.

Fullalove, Richard, to Henry Simon Limited. Sifting machine. 4,370,226, Cl. 209-332.000.

Funahashi, Jun: *See*—
Chiba, Akio; and Funahashi, Jun, 4,369,981, Cl. 280-5.00A.

Funaki, Hidefumi, to Anelva Corporation. Target assembly comprising, for use in a magnetron-type sputtering device, a magnetic target plate and permanent magnet pieces. 4,370,217, Cl. 204-298.000.

Furler, Alan G., to Mallinckrodt, Inc. Probe with electrocardiographic monitoring. 4,369,794, Cl. 128-671.000.

Furnier-U. Sperrholzwerk, J. F. Werz Jr. KG: *See*—
Munk, Edmund; and Huber, Helmuth, 4,369,716, Cl. 108-51.100.

Furr, Danny L., to Phillips Petroleum Company. Control of fuel gas blending. 4,369,803, Cl. 137-6.000.

Furuichi, Katsushi: *See*—
Murakami, Katsumi; Furuichi, Katsushi; and Honma, Toshio, 4,370,052, Cl. 355-14.00R.

Furuichi, Shuhei; and Suzuki, Masakazu, to Kabushiki Kaisha Morita Seisakusho. Device for stabilizing tube current in X-ray photographing apparatus. 4,370,752, Cl. 378-110.000.

Furukawa, Kaoru: *See*—
Kakumoto, Hiromi; and Furukawa, Kaoru, 4,370,606, Cl. 320-35.000.

Furuta, Kenzi: *See*—
Kanayama, Katsumi; Motoyama, Kazuyasu; and Furuta, Kenzi, 4,370,684, Cl. 360-74.200.

Furuya, Katusuke: *See*—
Watanabe, Kenkichi; Furuya, Katusuke; and Kimoto, Toyoki, 4,369,800, Cl. 133-8.00R.

Fuse, Mario; and Takenouchi, Mutsuo, to Fuji Xerox Co., Ltd. Film type light receiving element and sputter method of manufacturing the same. 4,370,360, Cl. 427-76.000.

Fushiki, Yasuo: *See*—
Uekita, Masakazu; Fushiki, Yasuo; and Abe, Masaharu, 4,370,386, Cl. 428-458.000.

Futami, Toshio; and Yoshida, Kazutoshi, to Hitachi, Ltd. Magnetic bubble memory device. 4,370,735, Cl. 365-16.000.

Fuzeau, Michel: *See*—
de Sivry, Bruno; Sudreau, Bernard; Carsac, Claude; Hamon, Jean-Pierre; and Fuzeau, Michel, 4,370,541, Cl. 219-121.0EC.

Fuzii, Tadashi: *See*—
Toyoda, Tsutomu; Maekawa, Iwao; Izumi, Hirobumi; and Fuzii, Tadashi, 4,370,446, Cl. 525-36.000.

Gadelle, Claude; Burger, Jacques; and Bardon, Charles, to Institut Francais du Petrole. Process for consolidating geological formations. 4,370,078, Cl. 405-264.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Oral composition containing antibacterial agent. 4,370,314, Cl. 424-54.000.

Gaffin, Stephen L.: *See*—
Neeman, Ishak; and Gaffin, Stephen L., 4,370,413, Cl. 435-39.000.

Gagliardi, Georges, to Ateliers et Chantiers de Bretagne. Remote manipulator arm. 4,370,091, Cl. 414-735.000.

Gaku, Morio; and Ikeguchi, Nobuyuki, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition from polyfunctional aromatic ester and maleimide compound. 4,370,467, Cl. 528-322.000.

Galliani, Giulio: *See*—
Omodei-Sale, Amedeo; Consonni, Pietro; Galliani, Giulio; and Lerner, Leonard, 4,370,336, Cl. 424-269.000.
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, 4,370,337, Cl. 424-269.000.

Gamm, Paul B., to Jung Products, Inc. Multi-purpose anatomical support wrap. 4,369,775, Cl. 128-166.000.

Gamou, Takaharu: *See*—
Moriwaki, Yoshio; Gamou, Takaharu; Yanagihara, Nobuyuki; Yamashita, Toshio; and Iwaki, Tsutomu, 4,370,163, Cl. 420-582.000.

Gangal, Subhash V.; and Olson, Allan H., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene polymer dispersions. 4,370,376, Cl. 428-241.000.

Gannaway, Edwin L., to Tecumseh Products Company. Discharge gas temperature control. 4,370,099, Cl. 417-32.000.

Gant, Gary L.: *See*—
Muntean, George; Wilson, Harry L.; and Gant, Gary L., 4,369,750, Cl. 123-505.000.

Gardel, William: *See*—
Mizoule, Henri, 4,369,579, Cl. 33-1.00M.

Garlanov, Dimo T.; Beloev, Marin G.; Hlebarov, Vladimir P.; Kolarova, Mariana V.; and Vangelov, Ivan V., to NPK za Kontrolno Zavarachni Raboti. Device for the manual start-up of a plasma torch. 4,370,539, Cl. 219-121.0PW.

Garlanov, Dimo T.: *See*—
Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., 4,369,919, Cl. 239-79.000.

Garnett, Eric W. D.: *See*—
Lane, Marvin M.; and Garnett, Eric W. D., 4,369,886, Cl. 209-564.000.

Garrett, Elgie E.: *See*—
Capek, Raymond G.; and Garrett, Elgie E., 4,370,630, Cl. 333-24.00C.

Gartside, Robert J.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; Gartside, Robert J.; and Johnson, Axel R., 4,370,303, Cl. 422-144.000.

Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, to DeSoto, Inc. Siliconized polyester thermosetting coating compositions. 4,370,441, Cl. 524-539.000.

Gattuso, David A.: *See*—
Izu, Masatsugu; Barnard, Timothy J.; and Gattuso, David A., 4,369,730, Cl. 118-723.000.

Gatzke, Kenneth G.: *See*—
Winslow, John M.; and Gatzke, Kenneth G., 4,370,401, Cl. 430-178.000.

Gaudio, John J. Pattern generation system. 4,370,733, Cl. 364-900.000.

Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Kick-down circuit for automatic change-speed transmissions. 4,369,676, Cl. 74-868.000.

Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and by Ryss, Maria I., legal representative. Method of positioning and rotating workpiece and arrangement implementing same. 4,369,603, Cl. 51-236.000.

Gehring, Fritz; Windischbauer, Florian; and Haussler, Horst, to Lindauer Dornier Gesellschaft mbH. Device for coupling a heddle frame to vertically reciprocating drive bars. 4,369,815, Cl. 139-57.000.

Gelinas, Wilfred R., to Harris Corporation. Printing press. 4,369,705, Cl. 101-177.000.

General Atomic Company: *See*—
Purcell, John R.; Chen, Wilkie Y.; and Toffolo, Walter E., 4,369,636, Cl. 62-514.00R.

General Dynamics Corporation: *See*—
McArdle, Beryl L., 4,370,519, Cl. 178-22.140.

General Dynamics, Pomona Division: *See*—
Frazier, Lawrence M.; and Lewis, Benjamin G., 4,370,656, Cl. 343-112.00D.

General Electric Company: *See*—
Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish M., 4,370,661, Cl. 346-74.500.
Hayes, Susan E.; and Eckberg, Richard P., 4,370,358, Cl. 427-54.100.
Leroux, Marcel H., 4,370,070, Cl. 374-170.000.
Madden, James A.; and LeDuc, Kenneth C., 4,369,570, Cl. 29-730.000.
Mahony, John E., 4,370,646, Cl. 340-722.000.
McCoy, Charles E., Jr.; and Crowgey, James L., 4,370,713, Cl. 364-424.000.
Perman, Gifford T.; and Poff, David A., 4,369,684, Cl. 83-216.000.
Sugalski, Raymond K., 4,369,571, Cl. 29-731.000.
VanPatten, John R., 4,370,636, Cl. 335-132.000.
Webster, Harold F., 4,370,590, Cl. 313-391.000.
Wellman, Carl E., Jr.; and Hornung, Richard E., 4,370,692, Cl. 361-109.000.

General Electric Company Limited, The: *See*—
Newbould, Adrian O., 4,370,691, Cl. 361-62.000.

General Motors Corporation: *See*—
Donley, William B., 4,370,669, Cl. 357-23.000.

General Scanning, Inc.: *See*—
Montagu, Jean I., 4,370,613, Cl. 324-154.00R.

Generali, Marcel, to Foseco International Limited. Sealing joints in moulds. 4,369,830, Cl. 164-137.000.

George, Kathleen F., to Union Carbide Corporation. Catalyst composition for copolymerizing ethylene. 4,370,456, Cl. 526-125.000.

Georgetown University: *See*—
Gregory, William D.; and Morelli, Luigi, 4,370,611, Cl. 324-61.00R.

Gerber, Dennis J., to Acrometal Products, Inc. Apparatus for tracking belt for abrasive grinding machine. 4,369,601, Cl. 51-135.0BT.

Gerber, Robert L.; and Raper, Larry C., to United States of America, Navy. Waveguide switch. 4,370,631, Cl. 333-106.000.

Gergis, Isoris S., to United States of America, Air Force. Switching method for effecting replication in magnetic bubble devices. 4,370,734, Cl. 365-12.000.

Gerrard, Andrew: *See*—
Bateson, Simon V. R.; and Gerrard, Andrew, 4,369,866, Cl. 192-3.570.

Gerstenberger, Friedrich; and Jaedicke, Ludwig, to Anschutz GmbH. Recoilless air weapon. 4,369,759, Cl. 124-68.000.

Gess, Larry C. Apparatus for producing packages of two webs of varying lengths and widths. 4,369,613, Cl. 53-553.000.

Geyken, Erwin: *See*—
Van Bouwel, Leo; Geyken, Erwin; Ertl, Franz; and Fleck, Adolf, 4,370,046, Cl. 354-324.000.

Gezovich, Donald M.: *See*—
Lee, Shu M.; and Gezovich, Donald M., 4,370,141, Cl. 8-115.500.

Ghosh, Anil C.; and Razdan, Raj K., to SISA, Incorporated. 17-Cyclopropylmethyl-3-hydroxy-14-methoxy 7α-methyl-morphinan-6-one and therapeutic method of treating pain with it. 4,370,333, Cl. 424-260.000.

Ghosh, Syamal K.; and Kelly, Frank J D., to A. B. Dick Company. Equisensitive ambipolar indium doped selenium containing electrophotographic materials, plates and method. 4,370,399, Cl. 430-58.000.

Gibb, Owen L. Automatic nulling circuit for transient pressure rate changes. 4,369,661, Cl. 73-755.000.

Gibbons, John E. C.: *See*—
Bunce, Roger A.; Gibbons, John E. C.; and Kricka, Larry J., 4,369,664, Cl. 73-864.120.

Gibson, Paul W.: *See*—
Lehnhardt, William F.; Gibson, Paul W.; and Orthoefer, Frank T., 4,370,267, Cl. 260-123.500.

Giethoorn, Harmen: *See*—
Bosch, Gerrit; Kok, Arnoldus W.; and Giethoorn, Harmen, 4,369,567, Cl. 29-607.000.

Giggey, Robert W.; Serletic, Bernard T.; and Ashley, Charles R., to Howmedica, Inc. Pop-up armed suture. 4,369,880, Cl. 206-63.300.

Gildemeister, Horst; Mildenberger, Hilmar; Knauf, Werner; Walters-dorfer, Anna; and Sachse, Burkhard, to Hoechst Aktiengesellschaft. (Thiono) (thiol) phosphoric (phosphonic) acid esters and ester-amides of substituted 4-hydroxyquinolines and their use as agents for combating pests. 4,370,320, Cl. 424-200.000.

Gillett, William G.: *See*—
Offutt, Elmer B.; Babich, Edward; and Gillett, William G., 4,369,897, Cl. 221-227.000.

Gilson, Richard W.; and Windischman, Edward F., to Sherwood Medical Industries Inc. Luer connector. 4,369,781, Cl. 128-214.00R.

Gise, Glenn A.; and Edleblute, Calvin M., to Black & Decker Inc. Feed mechanism for filament type vegetation trimmer. 4,369,577, Cl. 30-276.000.

Gisiger, Hermann. Bed for sick person. 4,369,533, Cl. 5-61.000.

Gist, Adolphus V.: *See*—
Whiteside, Ross C., Jr.; Gist, Adolphus V.; and Doorakian, George A., 4,370,465, Cl. 528-104.000.

Glacier Industries, Inc.: *See*—
Wight, Edward M., 4,369,612, Cl. 53-494.000.

Gladney, Walter W.: *See*—
Franken, Jeffrey J.; Gladney, Walter W.; and Yeich, William R., 4,370,294, Cl. 264-571.000.

Glasson, Richard E.: *See*—
Kasting, Edward W.; and Glasson, Richard E., 4,369,627, Cl. 60-605.000.

Glaxo Group Limited: *See*—
Busse, Michael J.; and Lees, Kenneth A., 4,370,322, Cl. 424-243.000.

Glennon, Timothy F.: *See*—
Faulkner, Dennis T.; Glennon, Timothy F.; and Markunas, Albert L., 4,370,560, Cl. 290-40.00C.

Glover, Russell K.: *See*—
Jones, Jack D.; and Glover, Russell K., 4,369,801, Cl. 134-58.00R.

Goald, Harold J. Reversed forceps for microdisc surgery. 4,369,788, Cl. 128-321.000.

Goddin, Clifton S., Jr.; and McGalliard, Russell L., to Standard Oil Company (Indiana). Process for separating relatively pure fractions of methane and carbon dioxide from gas mixtures. 4,370,156, Cl. 62-17.000.

Goeth, Hanns: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,370,327, Cl. 424-246.000.

Gomi, Shintaro: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,370,522, Cl. 179-1.0GD.

Goode, Keith F., to Ingersoll Milling Machine Company, The. Tool head having nutating spindle. 4,370,080, Cl. 409-200.000.

Goodyear Tire & Rubber Company, The: *See*—
Heater, Paul L., 4,370,452, Cl. 525-438.000.
Kline, Richard H., 4,370,434, Cl. 524-289.000.

Gopel, Helmut; and Klapp, Hartmut, to Jagenberg Werke AG. Apparatus for withdrawing flat carton blanks from a stack thereof. 4,369,961, Cl. 271-10.000.

Gossink, Robert G.: *See*—
Khoe, Giok D.; Gossink, Robert G.; and Jochem, Cornelis M. G., 4,370,021, Cl. 350-96.180.

Gottlieb, Saul. Locking assembly. 4,369,552, Cl. 24-230.00R.

Goudy, Paul R., Jr., to Landis, Bruce J.; Landis, Kenneth J.; and Goudy, Paul R., Jr., a part interest. Thermal energy transfer apparatus and method. 4,369,835, Cl. 165-154.000.

Goudy, Paul R., Jr.: *See*—
Landis, Bruce J.; and Goudy, Paul R., Jr., 4,370,107, Cl. 417-413.000.

Governor and Company of the Bank of England, The: *See*—
Lee, Peter D., 4,370,057, Cl. 356-71.000.

Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Electrical connector for circuit board or substrate. 4,370,012, Cl. 339-75.0MP.

Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. Complanate contact terminal. 4,370,017, Cl. 339-176.0MP.

Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, to Diebold Incorporated. Banking media security mechanism for automatic banking machines. 4,370,006, Cl. 312-215.000.

Graham, Roy R., to PPG Industries, Inc. Aqueous dispersion of glass fibers and method and composition for producing same. 4,370,169, Cl. 106-267.000.

Grassl, Hans-Peter: *See*—
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,370,724, Cl. 364-561.000.

Gray, Thomas J., to Olin Corporation. Process of forming Raney alloy coated cathode for chlor-alkai cells. 4,370,361, Cl. 427-123.000.

Graybill, Wilmer B.; and Korach, Malcolm, to PPG Industries, Inc. Electrolytic process including recovery and condensation of high pressure chlorine gas. 4,370,209, Cl. 204-98.000.

Greaney, Martin O.; and Callantine, Merritt R., to Mead Johnson and Company. Progestational adjuvant therapy. 4,370,321, Cl. 424-243.000.

Green, Todd C., to Illinois Tool Works Inc. Lighted electrical pushbutton switch. 4,370,532, Cl. 200-314.000.

Greff, Daniel; Petit-Martenon, Francoise; and Toan, Tran, to Sederma. Post-depilatory composition reducing progressively the growth of body hair. 4,370,315, Cl. 424-94.000.

Gregory, William D.; and Morelli, Luigi, to Georgetown University. Identification of materials using their complex dielectric response. 4,370,611, Cl. 324-61.00R.

Greig, George H.; and Pettigrew, Archibald M., to Burroughs Corporation. Cross-coupled servo control mechanism for reel-to-reel tape drives. 4,370,683, Cl. 360-73.000.

Grein, Arpad: *See*—
Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,370,474, Cl. 536-6.400.

Greiner, Waldemar H.; and Muscat-Tyler, Denis P. Fence constructions and in fence elements therefor. 4,369,953, Cl. 256-24.000.

Grell, Gary J., to Norris Industries, Inc. Detained key assembly. 4,369,642, Cl. 70-389.000.

Greschner, Johann: *See*—
Bohlen, Harald; Greschner, Johann; Kulcke, Werner; and Nehmiz, Peter, 4,370,554, Cl. 250-491.100.

Griffin, Patrick J., to Honeywell Inc. Solenoid actuated servo system. 4,370,604, Cl. 318-687.000.

Griffith, William C., Jr.; and Brockleburst, Charles E., to Opelika Manufacturing Corporation. Needle lubricator system. 4,369,723, Cl. 112-281.000.

Grigo, Ulrich; Mertes, Josef; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Process for the production of polar-modified polypropylene and its use. 4,370,450, Cl. 525-262.000.

Grihangne, Andre E. High capacity oil recuperator for de-pollution in rough waters. 4,370,229, Cl. 210-242.300.

Grinding & Polishing Machinery Corp.: *See*—
Reiman, Ralph E., 4,369,606, Cl. 51-334.000.

Gritschke, Martin: *See*—
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,370,207, Cl. 204-95.000.

Grolig, Johann: *See*—
Stammann, Gunter; Becker, Robert; Grolig, Johann; and Waldmann, Helmut, 4,370,275, Cl. 260-463.000.

Groom, James S., to Package Machinery Company. Tonnage indicator for injection molding machine. 4,370,116, Cl. 425-171.000.

Grossoleil, Jacques: *See*—
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,370,426, Cl. 523-310.000.

Grover, Richard L.; and Humphrey, William D., to Brunswick Corporation. Filament wound vessels. 4,369,894, Cl. 220-414.000.

Gruber, Wilhelm; and Schroder, Gunter, to ROHM GmbH Chemische Fabrik. Process for producing methacrylic acid by oxidative dehydration of isobutyric acid and catalyst therefor. 4,370,490, Cl. 560-214.000.

Gruenberg, Wolf-Diethard: *See*—
Oberg, Hans-Joachim; Gruenberg, Wolf-Diethard; and Posse, Guenther, 4,369,915, Cl. 494-8.000.

Gruppo Lepetit S.p.A.: *See*—
Omodei-Sale, Amedeo; Consonni, Pietro; Galliani, Giulio; and Lerner, Leonard, 4,370,336, Cl. 424-269.000.
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, 4,370,337, Cl. 424-269.000.

Grzeika, Eugene W. Glazier's point driver. 4,369,909, Cl. 227-109.000.

GTE Laboratories Incorporated: *See*—
Pink, Francis X.; Persiani, Carmine; and Lublin, Paul, 4,370,751, Cl. 378-47.000.

GTE Products Corporation: *See*—
Becker, Jon; Miller, Kirby G.; and Burney, Charles F., 4,370,182, Cl. 156-52.000.
Bouchard, Andre C.; Hall, Harold H., Jr.; and Loughridge, Frederick A., 4,369,556, Cl. 29-25.150.

Gueissaz, Charles, to Compagnie de Construction Mecanique Sulzer, French Societe Anonyme. Controlled vortex pump feed for supplying cellulose-containing material to reaction vessel. 4,370,172, Cl. 127-1.000.

Guenther, Michael: *See*—
Backstein, Guenter; Unger, Hans W.; Guenther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,369,709, Cl. 102-229.000.

Guiho, Jean-Paul: *See*—
Brethon, Jean-Pierre; Guiho, Jean-Paul; Taniel, Gerard; and Viel, Georges, 4,370,555, Cl. 378-120.000.

Gulf Research & Development Company: *See*—
Ryu, Yumi P.; Anglin, James R.; and Singerman, Gary M., 4,370,245, Cl. 252-46.400.
Selwitz, Charles M.; and Schulz, Johann G., 4,370,253, Cl. 252-312.000.

Gundlach, Bertus L., to De Rijkslandbouwhogeschool. Method for measuring the volume of solid bodies and a measuring and/or reference chamber for performing said method. 4,369,652, Cl. 73-149.000.

Gustafsson, Sten-Ake, to Aktiebolaget Karlstads Mekaniska Werkstad. Barking drum and method. 4,369,823, Cl. 144-340.000.

Guunnewig, Hubert: *See*—
Hemfort, Heinrich; Peitzmann, August; Neukotter, Wilhelm; Pastsch, Gunthard; and Guunnewig, Hubert, 4,369,698, Cl. 99-486.000.

Guzman-Bofill, Carlos: *See*—
Dominguez-Ahedo, Carlos; and Guzman-Bofill, Carlos, 4,370,162, Cl. 75-90.00R.

Guzy, Raymond L., to Hughes Tool Company. Splice for lead-coated and insulated conductors. 4,370,518, Cl. 174-84.00R.

Haass, Adolf, to Siemens Aktiengesellschaft. Process and an apparatus for transmitting data across a two-wire line. 4,370,741, Cl. 370-24.000.

Habeeb, Nasser G.: *See*—
Widman, Lawrence E.; Habeeb, Nasser G.; and Darakjian, Raymond Z., 4,370,136, Cl. 433-217.000.

Haberl, Rainer; and Kastner, Josef, to Semperit AG. Capacitor for measuring forces. 4,370,697, Cl. 361-283.000.

Habich, Adolph B.; and Hunt, Ronald E., to International Business Machines Corp. Print package. 4,370,071, Cl. 400-144.200.

Hagen, Hans, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Passenger vehicle such as a bus having a laterally extending stair assembly. 4,369,984, Cl. 280-166.000.

Haggerty, William A.: *See*—
Berenberg, John A.; Haggerty, William A.; Kegg, Richard L.; Schmenk, Myron J.; and Taylor, Ralph C., Jr., 4,370,721, Cl. 364-474.000.

Hagman, Emanuel F. Disc-type check valve. 4,369,808, Cl. 137-515.500.

Hall, Floyd V., to Liggett Group Inc. Method and apparatus for forming an air dilution filter. 4,369,796, Cl. 131-95.000.

Hall, Harold H., Jr.: *See*—
Bouchard, Andre C.; Hall, Harold H., Jr.; and Loughridge, Frederick A., 4,369,556, Cl. 29-25.150.

Halle, Reidar: *See*—
Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, 4,370,459, Cl. 526-227.000.

Halliburton Company: *See*—
Szarka, David D.; and Baker, Eugene E., 4,369,840, Cl. 166-214.000.

Hallmark, Bobby J. Selective earth formation testing through well casing. 4,369,654, Cl. 73-151.000.

Halon, Bernard; and Vossen, John L., Jr., to RCA Corporation. Removal of plasma etching residues. 4,370,195, Cl. 156-643.000.

Halon, Bernard: *See*—
Vossen, John L., Jr.; and Halon, Bernard, 4,370,196, Cl. 156-643.000.

Ham, Allan L.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,370,328, Cl. 424-250.000.

Hamada, Eiichi: *See*—
Sarai, Hiroshi; Hamada, Eiichi; and Ueda, Norihiro, 4,370,005, Cl. 384-154.000.

Hamane, Masumi; and Kondo, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission device. 4,369,674, Cl. 74-752.00E.

Hamano, Isao; and Yabunaka, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Method of connecting armature coil of rotary machine. 4,369,910, Cl. 228-110.000.

Hamm, James R.; and Young, William E., to Westinghouse Electric Corp. High temperature gas turbine systems. 4,369,624, Cl. 60-39.120.

Hamon, Jean-Pierre: *See*—
de Sivry, Bruno; Sudreau, Bernard; Carsac, Claude; Hamon, Jean-Pierre; and Fuzeau, Michel, 4,370,541, Cl. 219-121.0EC.

Han, Jeong S. Hour and minute display for a chronometer. 4,370,068, Cl. 368-240.000.

Hanagata, Takayoshi: *See*—
Noda, Atsushi; and Hanagata, Takayoshi, 4.370,666, Cl. 346-76.0PH.

Hanaway, Roger D.; and James, Larry R., to Allis-Chalmers Corporation. Feeder idler drum shaft with removable extensions. 4,369,617, Cl. 56-14.600.

Haneishi, Tatsuo: *See*—
Arai, Mamoru; Haneishi, Tatsuo; Nakajima, Mutsuo; Torikata, Akio; and Enokita, Ryuzo, 4,370,266, Cl. 260-112.50R.

Hanson, Donald B.; and Metzger, Frederick B., to United Technologies Corporation. Noise reduction means for prop-fan. 4,370,097, Cl. 416-228.000.

Hanson, Raymond; and White, Anthony M., to USM Corporation. Apparatus for use in heat setting a lasted shoe upper. 4,369,536, Cl. 12-1.00A.

Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Diamond compact for a wire drawing die and a process for the production of the same. 4,370,149, Cl. 51-309.000.

Hara, Hajime: *See*—
Omika, Hiroyoshi; Hara, Hajime; Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,370,453, Cl. 525-450.000.

Hara, Toshitami; and Matsumoto, Shigeyuki, to Canon Kabushiki Kaisha. Liquid ejecting recording process. 4,370,668, Cl. 346-140.00R.

Harada, Masanori: *See*—
Ito, Kosuke; Iida, Hiroshi; Harada, Masanori; and Hatakenaka, Masato, 4,369,752, Cl. 123-568.000.

Harada, Taira; Shimizu, Toyozi; and Nagaoka, Takenori, to Mitsui Petrochemical Industries Ltd. Process for producing p-nitroaniline. 4,370,502, Cl. 564-411.000.

Harada, Takashi: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; and Shimazaki, Hiroshi, 4,370,290, Cl. 264-184.000.

Harbor Industries, Inc.: *See*—
Emery, Merton D., 4,369,887, Cl. 211-49.00D.

Harder, Arthur J., Jr., to Coach & Car Equipment Corporation. Wheelchair and occupant restraining apparatus. 4,369,995, Cl. 296-65.00A.

Hargis, Duane C.; and Dubeck, Michael, to Ethyl Corporation. Ethanol from methanol and synthesis gas. 4,370,507, Cl. 568-902.000.

Hargrave, Thomas A., to Rockwell International Corporation. Electrical interlock. 4,370,694, Cl. 361-179.000.

Harigaya, Isao; and Tamamura, Hideo, to Canon Kabushiki Kaisha. Photographing operation control device for camera. 4,370,043, Cl. 354-173.000.

Harnisch, Horst, to Bayer Aktiengesellschaft. Biphenyl compounds, a process for their preparation and their use as intermediate products for optical brighteners, dyestuffs, plastics and medicaments. 4,370,486, Cl. 549-46.000.

Harper, James L. Process for enriching the protein content of food and feedstuff and products thereof. 4,370,351, Cl. 426-7.000.

Harrington, John H.: *See*—
Novinski, Edward R.; and Harrington, John H., 4,370,367, Cl. 427-423.000.

Harris Corporation: *See*—
Gelinas, Wilfred R., 4,369,705, Cl. 101-177.000.

Harris, William R.; and Jache, Harold G., to Jostens Inc. Yellow metal alloy. 4,370,164, Cl. 420-503.000.

Hartford, Thomas D. Liquid applying apparatus. 4,369,596, Cl. 47-1.500.

Hartke, David H.: *See*—
Sprague, Robert A.; Turner, William D.; and Hartke, David H., 4,370,029, Cl. 350-355.000.

Hartmann, Heinrich: *See*—
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.

Hartmann & Lammle GmbH & Co. KG: *See*—
Schulze, Eckehart, 4,369,693, Cl. 91-35.000.

Harvey, Raymond A., to Xerox Corporation. Stitchers. 4,369,908, Cl. 227-90.000.

Hashimoto, Shinichi: *See*—
Shibuya, Kunihiro; Uchida, Koachi; and Hashimoto, Shinichi, 4,370,048, Cl. 355-3.0TR.

Hatakenaka, Masato: *See*—
Ito, Kosuke; Iida, Hiroshi; Harada, Masanori; and Hatakenaka, Masato, 4,369,752, Cl. 123-568.000.

Hatta, Yoshio: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, 4,370,208, Cl. 204-98.000.

Hattori, Izu: *See*—
Usher, Thomas C.; and Hattori, Izu, 4,370,476, Cl. 536-113.000.

Hattori, Masaichi: *See*—
Takeda, Nobuhiro; Mizuno, Shigeo; Hattori, Masaichi; and Takaishi, Yukio, 4,370,638, Cl. 335-186.000.

Hattori, Takemi: *See*—
Kazaoka, Kenichi; and Hattori, Takemi, 4,370,000, Cl. 297-284.000.

Haussler, Horst: *See*—
Gehring, Fritz; Windischbauer, Florian; and Haussler, Horst, 4,369,815, Cl. 139-57.000.

Haviv, Fortuna; DeNet, Robert W.; and Boulanger, William A., to Abbott Laboratories. Method for treating inflammatory conditions. 4,370,339, Cl. 424-273.00P.

Hawkins, James B.: *See*—
Van Doorn, Donald W.; and Hawkins, James B., 4,369,681, Cl. 83-100.000.

Haworth Mfg., Inc.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., 4,370,008, Cl. 339-4.000.

Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., to Haworth Mfg., Inc. Wall panel with prewired power system. 4,370,008, Cl. 339-4.000.

Hayakawa, Yoichi: *See*—
Matsumoto, Goichi; and Hayakawa, Yoichi, 4,369,671, Cl. 74-665.0GA.

Hayashi, Kyozo, to Sumitomo Electric Industries, Ltd. Protector for molten metal casting stream. 4,369,831, Cl. 164-415.000.

Hayashi, Teruyuki: *See*—
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,370,258, Cl. 252-429.00R.

Hayashibara Biochemical Laboratories, Inc.: *See*—
Igarashi, Toshiji; Nomura, Keiichi; Naito, Kunji; and Yoshida, Mikihiko, 4,370,472, Cl. 536-1.100.

Hayden, Rodney, to TRW Inc. Timed electric switch. 4,370,565, Cl. 307-141.000.

Hayes, Derek. Electrical coupling devices. 4,370,016, Cl. 339-103.00M.

Hayes, Susan E.; and Eckberg, Richard P., to General Electric Company. Ultraviolet curable silicone adhesives. 4,370,358, Cl. 427-54.100.

Hayes, Thomas D.; Kabrick, Randolph M.; and Jewell, William J., to Cornell Research Foundation, Inc. Chemical detoxification of sewage sludge. 4,370,233, Cl. 210-609.000.

Hays, Dan A., to Xerox Corporation. Development system. 4,370,056, Cl. 355-3.0DD.

Healy, Francis L. Parts handling machine. 4,370,092, Cl. 414-752.000.

Heater, Paul L., to Goodyear Tire & Rubber Company, The. Process to induce rapid curing of a copolyester resin with epoxide compounds and a composition formed for that process. 4,370,452, Cl. 525-438.000.

Hebold, Gottfried: *See*—
Kampe, Wolfgang; Thiel, Max; Fauland, Erich; Bicker, Uwe; and Hebold, Gottfried, 4,370,323, Cl. 424-244.000.
Heck, Gunther: *See*—
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,261, Cl. 252-460.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,492, Cl. 560-245.000.
Hedman, Dale E.: *See*—
Wilson, Delano D.; and Hedman, Dale E., 4,370,609, Cl. 324-51.000.
Heijola, Pentti; and Burmeister, Fredrik, to Oy Wartsila Ab. Air-cushion vehicle. 4,369,853, Cl. 180-117.000.
Hein, James R.; Herr, Wayne T., Sr.; Niemiec, John J.; and Dombrowski, Philip. Spine board. 4,369,982, Cl. 280-47.13R.
Helin, Aimo: *See*—
Salmi, Pekka; and Helin, Aimo, 4,369,848, Cl. 173-8.000.
Hemfort, Heinrich; Peitzmann, August; Neukotter, Wilhelm; Pautsch, Gunthard; and Guunnewig, Hubert, to Westfalia Separator AG. Arrangement for separating fruits into fruit pulp, fruit skin and fruit core. 4,369,698, Cl. 99-486.000.
Henderson, Alva; and Hoy, Douglas B., to Texas Instruments Incorporated. Relaxation oscillator including constant current source and latch circuit. 4,370,628, Cl. 331-111.000.
Hendrickson, Vergil P., to Caterpillar Tractor Co. Multi-piece wheel structure. 4,369,826, Cl. 152-410.000.
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, to Unie van Kunstmestfabrieken, B.V. Two-phase spraying device and reaction chamber for the preparation of a product containing ammonium orthophosphate. 4,370,304, Cl. 422-224.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Preuss, Wolfgang. 4,370,271, Cl. 260-397.450.
Henry Simon Limited: *See*—
Fullalove, Richard, 4,370,226, Cl. 209-332.000.
Henson, George S.; and Brooks, Joe, to Mobell Blowout Services Limited. Oil well blow-out control. 4,369,845, Cl. 166-298.000.
Heraeus Quarzschmelze GmbH: *See*—
Schulke, Karl A., 4,370,158, Cl. 65-32.000.
Herbrechtsmeier, Peter; Schafer, Hans; and Steiner, Rudolf, to Hoechst Aktiengesellschaft. Process and apparatus for gassing liquids. 4,370,151, Cl. 55-38.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, to Siemens Aktiengesellschaft. Circuit for the sensor controlled distance measurement. 4,370,724, Cl. 364-561.000.
Hercules Incorporated: *See*—
Leipold, Dianne P., 4,370,354, Cl. 426-573.000.
Heredia, Juan. Quick release device for fishing leader lines. 4,369,551, Cl. 24-201.00A.
Herr, Wayne T., Sr.: *See*—
Hein, James R.; Herr, Wayne T., Sr.; Niemiec, John J.; and Dombrowski, Philip, 4,369,982, Cl. 280-47.13R.
Herzig, Heinrich G.; and Rothfuss, Robert, to Wella Aktiengesellschaft. Coiffure demonstration head model. 4,370,137, Cl. 434-94.000.
Heuer, Helmut; Schapsmeier, Wilhelm; and Fohlmeister, Hans D., to Weserhutte Aktiengesellschaft. Stockpile reclaiming apparatus. 4,369,877, Cl. 198-509.000.
Heuft, Bernhard. Apparatus for laterally deflecting articles. 4,369,873, Cl. 198-/367.000.
Hewlett-Packard Company: *See*—
Hunsinger, Dan M., 4,370,569, Cl. 307-266.000.
O'Toole, Michael M.; Liu, En-Den D.; and Chang, Mark S., 4,370,405, Cl. 430-312.000.
Hicks, Alan A.; Morrison, Howard J.; Wildman, John R.; and Webb, Terry E., to Marvin Glass & Associates. Counting device with ball actuated aligned rotatable indicating elements. 4,370,064, Cl. 368-93.000.
Hidding, Walter E. Snap-up cover for spice dispenser. 4,369,901, Cl. 222-480.000.
Higgins, William E.; and Lazzara, Richard C., to Advanced Technology & Research, Inc. Method of joining honeycomb panels using a fastener element. 4,370,372, Cl. 428-116.000.
Hill, Fred G. Antenna apparatus and method for making same. 4,370,658, Cl. 343-713.000.
Hill, Jeffrey A.: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, 4,370,006, Cl. 312-215.000.
Hiller, Dietrich; Klatt, Peter; and Reul, Bernhard, to Hoechst Aktiengesellschaft. Device for the prophylactic or therapeutic treatment of cattle. 4,369,783, Cl. 128-260.000.
Hiltpold, William R., to American Microsystems, Inc. VMOS Memory cell and method for making same. 4,369,564, Cl. 29-571.000.
Hiraguri, Seisuke, to Victor Company of Japan, Ltd. Circuit for time compression and expansion of audio signals. 4,370,524, Cl. 179-15.55T.
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Kitamura, Takahiko, to Ricoh Company, Ltd. Toner concentration control apparatus. 4,369,733, Cl. 118-691.000.
Hirano, Junzo; and Inoue, Yukio, to Nippon Telegraph & Telephone Public Corp. Time division multiplex communication system. 4,370,744, Cl. 370-88.000.
Hirata, Atsumi, to Victor Company of Japan, Ltd. Rotary recording medium. 4,370,740, Cl. 369-276.000.
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, to Toyo Seikan Kaisha, Ltd. Plastic bottles and process for preparation thereof. 4,370,368, Cl. 428-35.000.
Hiratsuka, Ko: *See*—
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, 4,370,102, Cl. 417-296.000.
Hirayama, Kazuhiro; and Ito, Michio, to Canon Kabushiki Kaisha. Developer supply device. 4,370,053, Cl. 355-14.00D.
Hirayama, Tsutomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Engine cooling system with optionally communicable head cooling circuit and block cooling circuit, and method of operating the same. 4,369,738, Cl. 123-41.100.
Hirose, Katsutoshi: *See*—
Murase, Isao; Hirose, Katsutoshi; and Yoneya, Shoji, 4,370,060, Cl. 356-417.000.
Hiroshige, Kunie: *See*—
Katagiri, Mikio; Sakota, Yukio; Hiroshige, Kunie; and Adachi, Yukio, 4,370,187, Cl. 156-244.230.
Hirschberg, Rudolf; and Schonfeld, Bernd, to Riedel-De Haen Aktiengesellschaft. Chlorofluoroferrate(II,III), a process for its manufacture, its use and a grinding wheel containing chlorofluoroferrate(II,III). 4,370,148, Cl. 51-293.000.
Hitachi Cable Limited: *See*—
Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shiina, Toshio, 4,370,517, Cl. 174-74.00A.
Hitachi Chemical Company, Ltd.: *See*—
Toyoda, Tsutomu; Maekawa, Iwao; Izumi, Hirobumi; and Fuzii, Tadashi, 4,370,446, Cl. 525-36.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Izumi, Eiki; Honma, Kazuo; Abe, Katsuro; Uno, Masaaki; and Nakajima, Kichio, 4,369,625, Cl. 60-327.000.
Hitachi Heating Appliances Co., Ltd.: *See*—
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, 4,370,545, Cl. 219-491.000.
Hitachi Koki Company, Limited: *See*—
Kobayashi, Jyuro; Ito, Masanori; and Ishikawa, Hiroyasu, 4,370,579, Cl. 310-50.000.
Hitachi, Ltd.: *See*—
Futami, Toshio; and Yoshida, Kazutoshi, 4,370,735, Cl. 365-16.000.
Kajiwara, Toshiyuki, 4,369,646, Cl. 72-243.000.
Kaneko, Kenji; and Okabe, Takahiro, 4,370,627, Cl. 331-108.00D.
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Oboshi, Tokio, 4,370,421, Cl. 501-88.000.
Muramatsu, Akira, 4,369,565, Cl. 29-580.000.
Satoh, Yoshio, 4,370,591, Cl. 313-402.000.
Ueno, Sadayasu; Sato, Kanemasa; Oyama, Yoshishige; Nishimura, Yutaka; and Miya, Kazuhiko, 4,369,656, Cl. 73-204.000.
Hitaci, Ltd.: *See*—
Miyanaka, Motoshi; Toudo, Kenzi; Kudo, Yoshinori; and Nakagawa, Sumio, 4,370,126, Cl. 431-73.000.
Hlebarov, Vladimir P.: *See*—
Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., 4,369,919, Cl. 239-79.000.
Garlanov, Dimo T.; Beloev, Marin G.; Hlebarov, Vladimir P.; Kolarova, Mariana V.; and Vangelov, Ivan V., 4,370,539, Cl. 219-121.0PW.
Ho, Winston: *See*—
Mohrbacher, Richard; Ho, Winston; and Tutwiler, Gene, 4,370,343, Cl. 424-275.000.
Hobart, Floyd E., Jr., to Western Electric Company, Inc. Universal strand clamp and strand clamp assembly. 4,369,944, Cl. 248-56.000.
Hoechst Aktiengesellschaft: *See*—
Boesenberg, Heinz; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, 4,370,489, Cl. 560-62.000.
Gildemeister, Horst; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Sachse, Burkhard, 4,370,320, Cl. 424-200.000.
Herbrechtsmeier, Peter; Schafer, Hans; and Steiner, Rudolf, 4,370,151, Cl. 55-38.000.
Hiller, Dietrich; Klatt, Peter; and Reul, Bernhard, 4,369,783, Cl. 128-260.000.
Papenfuhs, Theodor, 4,370,483, Cl. 548-165.000.
Schwaiger, Gunther; and Hoyer, Ernst, 4,370,145, Cl. 8-549.000.
Uhle, Karlheinz; and Kramer, Horst, 4,369,648, Cl. 73-61.400.
Uhle, Karlheinz; and Kramer, Horst, 4,369,649, Cl. 73-61.400.
Weingarten, Friedrich W.; Hunger, Klaus; and Klappert, Ernst, 4,370,269, Cl. 260-157.000.
Welter, Wolfgang; and Mildenberger, Hilmar, 4,370,277, Cl. 260-465.00F.
Welter, Wolfgang; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Bonin, Werner, 4,370,345, Cl. 424-282.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,261, Cl. 252-460.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,492, Cl. 560-245.000.
Hoek, Cornelis: *See*—
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,370,304, Cl. 422-224.000.
Hoelzle & Chelius KG: *See*—
Affonso, Alvaro, 4,370,305, Cl. 422-292.000.
Hoffman, Joseph A., to American Cyanamid Company. Hindered amine light stabilizers for polymers. 4,370,430, Cl. 524-96.000.
Hoffmann, Arthur K.: *See*—
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,370,482, Cl. 548-155.000.

Hoffmann, Herwig: *See*—
Bott, Kaspar; Kaibel, Gerd; Hoffmann, Herwig; Irnich, Rudolf; and Schaefer, Eberhard, 4,370,491, Cl. 560-234.000.
Hohyu Rubber Co., Ltd.: *See*—
Nakahira, Akitaro, 4,370,371, Cl. 428-65.000.
Holle, Dietrich: *See*—
Schmidt, Sylvia; Eckert, Hansdieter; Holzinger, Wolfgang; and Holle, Dietrich, 4,370,200, Cl. 162-210.000.
Holman, George B.: *See*—
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,370,166, Cl. 106-97.000.
Holmes, William A., to Polaroid Corporation. Film processor. 4,370,045, Cl. 354-304.000.
Holt, James L.; Mahoney, John M.; and McLeod, Kenneth M., to Outboard Marine Corporation. Electronic lubricant metering system. 4,369,743, Cl. 123-196.00S.
Holtz, R. Barry, to Spawn Mate, Inc. Nutrient for mushroom growth and process for producing same. 4,370,159, Cl. 71-5.000.
Holzinger, Wolfgang: *See*—
Schmidt, Sylvia; Eckert, Hansdieter; Holzinger, Wolfgang; and Holle, Dietrich, 4,370,200, Cl. 162-210.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hamane, Masumi; and Kondo, Makoto, 4,369,674, Cl. 74-752.00E.
Niitsu, Mitsugi; Yamazaki, Shuichi; and Kimura, Shigeru, 4,370,013, Cl. 339-82.000.
Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, 4,369,695, Cl. 91-375.00A.
Nishikawa, Masao; Toshimitsu, Yoshihiko; Iwasaki, Akira; and Fujimoto, Katsuhiko, 4,369,852, Cl. 180-148.000.
Honeywell Inc.: *See*—
Axmark, Roger E.; and Satren, Ernest A., 4,370,557, Cl. 250-554.000.
Griffin, Patrick J., 4,370,604, Cl. 318-687.000.
Lane, Charles E., III, 4,370,018, Cl. 339-263.00R.
Zansky, Zoltan, 4,370,600, Cl. 315-244.000.
Honeywell Information Systems Inc.: *See*—
Bruce, Kenneth E.; Conway, John W.; Lombardo, Ralph M., Jr.; and Tarbox, Bruce H., 4,370,708, Cl. 364-200.000.
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,370,712, Cl. 364-200.000.
Keene, Bruce C., 4,370,573, Cl. 307-514.000.
Nielsen, Raymond E., 4,370,574, Cl. 307-514.000.
Hongu, Masayuki; Omuro, Shigeru; Kita, Hiroyuki; and Tokuhara, Masaharu, to Sony Corporation. Carrier regenerating circuit for a synchronous detector. 4,370,676, Cl. 358-188.000.
Honigsberg, Charles A.: *See*—
Pennell, William E.; and Honigsberg, Charles A., 4,369,893, Cl. 220-378.000.
Honl, Wolf-Dieter: *See*—
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,369,932, Cl. 242-107.40A.
Honma, Kazuo: *See*—
Izumi, Eiki; Honma, Kazuo; Abe, Katsuro; Uno, Masaaki; and Nakajima, Kichio, 4,369,625, Cl. 60-327.000.
Honma, Toshio: *See*—
Murakami, Katsumi; Furuichi, Katsushi; and Honma, Toshio, 4,370,052, Cl. 355-14.00R.
Honma, Tsunetoshi: *See*—
Igarashi, Kikuo; Honma, Tsunetoshi; and Sugawara, Tamio, 4,370,475, Cl. 536-16.800.
Hoover, Richard B., to United States of America, National Aeronautics and Space Administration. Extended range X-ray telescope. 4,370,750, Cl. 378-43.000.
Horii, Shigeru; Yoshikawa, Nobuhisa; and Koyama, Kazutaka, to Matsushita Electric Industrial Co., Ltd. High pressure discharge lamp apparatus. 4,370,601, Cl. 315-307.000.
Horike, Masanori; Yoshiba, Yutaka; and Ebi, Yutaka, to Ricoh Company, Ltd. Ink jet printing apparatus. 4,370,664, Cl. 346-75.000.
Horikoshi, Katsunori; and Abe, Tsutomu, to Asahi Kasei Kogyo Kabushiki Kaisha. Granulocyte-separating material and granulocyte separator. 4,370,381, Cl. 428-392.000.
Horizon Chemical, Inc.: *See*—
Kenny, Thomas C.; and Plunkett, John P., 4,370,147, Cl. 44-68.000.
Horlein, Gerhard: *See*—
Boesenberg, Heinz; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, 4,370,489, Cl. 560-62.000.
Hornbeck, Sherman J.; and Thornton, Jack C., to Rockwell International Corporation. IMD Limiter. 4,370,622, Cl. 330-207.00P.
Hornbuckle, William M. Sheet feed machine. 4,369,959, Cl. 271-3.100.
Hornung, Richard E.: *See*—
Wellman, Carl E., Jr.; and Hornung, Richard E., 4,370,692, Cl. 361-109.000.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Borated hydroxyl-containing acid esters and lubricants containing same. 4,370,248, Cl. 252-49.600.
Hosaka, Akihiko; Isobe, Yukihiro; and Okuyama, Kiyotaka, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,370,384, Cl. 428-425.900.
Hosoi, Sadao; and Takano, Masayuki, to Sony Corporation. Head tracking control system for a helical scan VTR. 4,370,685, Cl. 360-77.000.
Hosokawa, Minoru: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,370,065, Cl. 368-157.000.
Hoster, Clyde H. Hoists. 4,370,089, Cl. 414-589.000.
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, to Hitachi Heating Appliances Co., Ltd. Cooking apparatus. 4,370,545, Cl. 219-491.000.
Hou, Shou L.; and Tashiro, Isao, to Ricoh Company, Ltd. Ink jet array ultrasonic simulation. 4,370,662, Cl. 346-75.000.
Houchins, Stanley L.; and Jackson, Thomas B. Sink assembly. 4,369,532, Cl. 4-619.000.
Howa Kogyo Kabushiki Kaisha: *See*—
Kogiso, Takashi, 4,369,621, Cl. 57-267.000.
Howard, Richard E.: *See*—
Fetter, Linus A.; Howard, Richard E.; Hu, Evelyn L.; and Jackel, Lawrence D., 4,370,359, Cl. 427-63.000.
Howard, William A., to Delta Systems, Inc. Safety interlock for machine and engine with magneto ignition. 4,369,745, Cl. 123-198.0DC.
Howmedica, Inc.: *See*—
Giggey, Robert W.; Serletic, Bernard T.; and Ashley, Charles R., 4,369,880, Cl. 206-63.300.
Hoy, Douglas B.: *See*—
Henderson, Alva; and Hoy, Douglas B., 4,370,628, Cl. 331-111.000.
Hoyer, Ernst: *See*—
Schwaiger, Gunther; and Hoyer, Ernst, 4,370,145, Cl. 8-549.000.
Hsien-Sen, Liao. Peel concentrating clearance box. 4,369,574, Cl. 30-123.500.
Hu, Evelyn L.: *See*—
Fetter, Linus A.; Howard, Richard E.; Hu, Evelyn L.; and Jackel, Lawrence D., 4,370,359, Cl. 427-63.000.
Huber, Helmuth: *See*—
Munk, Edmund; and Huber, Helmuth, 4,369,716, Cl. 108-51.100.
Hudson, Howard J.: *See*—
Barch, Herbert W.; Melle, Carl A.; McWilliams, Donald E.; and Hudson, Howard J., 4,370,157, Cl. 65-3.430.
Huffman, Stanley S.; Neel, Alan F.; Swartout, Christopher A.; and Dvorak, Neil E., to Peak Demand Limiters, Inc. Computerized energy management system. 4,370,723, Cl. 364-483.000.
Huge, Gerald W., to Professional Positioners, Inc. Tooth positioner with harder areas. 4,370,129, Cl. 433-6.000.
Hughes Aircraft Company: *See*—
Lau, Kreisler S. Y., 4,370,501, Cl. 564-330.000.
Hughes, Richard H.; and Marks, Bruce G., to RCA Corporation. Color picture tube having an improved inline electron gun with an expanded focus lens. 4,370,592, Cl. 313-414.000.
Hughes Tool Company: *See*—
Guzy, Raymond L., 4,370,518, Cl. 174-84.00R.
Humber, Leslie G.: *See*—
Asselin, Andre A.; and Humber, Leslie G., 4,370,341, Cl. 424-274.000.
Hummert, George T.; Moser, Thomas D.; and Edison, David M., to Westinghouse Electric Corp. Elevator bank simulation system. 4,370,717, Cl. 364-436.000.
Humphrey, Kenneth M., to Underwater and Marine Equipment Limited. Flexible tubular joint. 4,369,814, Cl. 138-120.000.
Humphrey, William D.: *See*—
Grover, Richard L.; and Humphrey, William D., 4,369,894, Cl. 220-414.000.
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., to Abbott Laboratories. Recombinant deoxyribonucleic acid which codes for plasminogen activator. 4,370,417, Cl. 435-212.000.
Hunger, Klaus: *See*—
Weingarten, Friedrich W.; Hunger, Klaus; and Klappert, Ernst, 4,370,269, Cl. 260-157.000.
Hunsinger, Dan M., to Hewlett-Packard Company. Integratable single pulse circuit. 4,370,569, Cl. 307-266.000.
Hunt, Ronald E.: *See*—
Habich, Adolph B.; and Hunt, Ronald E., 4,370,071, Cl. 400-144.200.
Hurst, Ronald C.: *See*—
Williams, Frank R.; and Hurst, Ronald C., 4,370,308, Cl. 423-450.000.
Hussein, Said. Model train crossing gate. 4,369,943, Cl. 246-127.000.
Hutchins, Ferris L., Jr.: *See*—
Ingersoll, Brian; and Hutchins, Ferris L., Jr., 4,369,715, Cl. 108-2.000.
Hutchison, Marion: *See*—
Buschbom, Floyd E.; and Hutchison, Marion, 4,369,855, Cl. 180-212.000.
Hutter, Harold G.; and Francis, Leonard J., to Bunker Ramo Corporation. Coaxial tap connector. 4,370,015, Cl. 339-97.00P.
Hutter, Odo: *See*—
Kettner, Hans; and Hutter, Odo, 4,369,874, Cl. 198-396.000.
Hyatt, Gilbert P. Coordinate rotation for numerical control system. 4,370,720, Cl. 364-474.000.
Hybler, Ludmila, to Phillips Petroleum Company. Method and apparatus for cathodic protection. 4,370,211, Cl. 204-148.000.
Hyde, Leland M.: *See*—
David, Paul E.; and Hyde, Leland M., 4,369,918, Cl. 237-55.000.
Hyde, Thomas G.: *See*—
Clubley, Brian G.; Hyde, Thomas G.; and Keenan, John F. E., 4,370,281, Cl. 260-966.000.
Hylsa, S.A.: *See*—
Dominguez-Ahedo, Carlos; and Guzman-Bofill, Carlos, 4,370,162, Cl. 75-90.00R.
I. Bager & Co. A/S: *See*—
Nielsen, Erik S.; and Stacker, Poul, 4,369,619, Cl. 57-58.340.

Ichikoh Industries Limited: *See*—
Tamura, Takeo; Kido, Takayoshi; and Nakamura, Tatsuo, 4,369,542, Cl. 15-250.00B.
Ichinose, Isao; Mori, Fumio; and Suzuki, Noboru, to Toyo Seikan Kaisha, Ltd. Peelable bonded structures and process for preparing same. 4,370,190, Cl. 156-307.300.
Ichiyanagi, Toshikazu: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,370,037, Cl. 354-23.00D.
ICI Australia Limited: *See*—
Donaghue, Paul F.; Love, Thomas L.; Mitchell, Kenneth A. W.; and Pitt, Maxwell G., 4,369,689, Cl. 86-20.00C.
Igarashi, Kikuo; Honma, Tsunetoshi; and Sugawara, Tamio, to Shionogi & Co., Ltd. Apramycin derivatives. 4,370,475, Cl. 536-16.800.
Igarashi, Toshiji; Nomura, Keiichi; Naito, Kunji; and Yoshida, Mikihiko, to Hayashibara Biochemical Laboratories, Inc. Plasma expander. 4,370,472, Cl. 536-1.100.
Iida, Hiroshi: *See*—
Ito, Kosuke; Iida, Hiroshi; Harada, Masanori; and Hatakenaka, Masato, 4,369,752, Cl. 123-568.000.
Iida, Tamotsu; Enomoto, Seiji; and Kimura, Michiya, to Eiken Chemical Co., Ltd. Tray for identifying microorganisms. 4,370,419, Cl. 435-301.000.
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Electrolytic process of an aqueous alkali metal halide solution and electrolytic cell. 4,370,208, Cl. 204-98.000.
Iijima, Toshifumi; Fujimatsu, Wataru; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide color photosensitive material. 4,370,410, Cl. 430-505.000.
Ikeda, Tomoaki: *See*—
Tachikawa, Hironichi; Takahashi, Yohonosuke; Ishii, Kazuo; Ikeda, Tomoaki; and Shinozaki, Fumiaki, 4,370,404, Cl. 430-302.000.
Ikeguchi, Nobuyuki, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition. 4,370,462, Cl. 528-73.000.
Ikeguchi, Nobuyuki: *See*—
Gaku, Morio; and Ikeguchi, Nobuyuki, 4,370,467, Cl. 528-322.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Zoom objective of small size. 4,370,031, Cl. 350-426.000.
Ikeno, Hitoshi; Konno, Tetsuro; Sugita, Mitsuyuki; and Yanagi, Hirofumi, to Seikosha Co., Ltd. Electrode configuration for thickness-shear mode piezoelectric vibrator. 4,370,584, Cl. 310-365.000.
Ilekis, John V. Lipid assay based on aggregating properties. 4,370,311, Cl. 424-1.100.
Illinois Tool Works Inc.: *See*—
Green, Todd C., 4,370,532, Cl. 200-314.000.
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of alpha-olefins and method for using the same. 4,370,257, Cl. 252-429.00B.
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, to Fujitsu Fanuc Limited. Sequence control system for numerically controlled machine tool. 4,370,705, Cl. 364-184.000.
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, to Fujitsu Fanuc Limited. Tracer control system. 4,370,722, Cl. 364-474.000.
Imperial Chemical Industries Limited: *See*—
Bye, Ashley D., 4,370,449, Cl. 525-247.000.
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., 4,370,349, Cl. 424-365.000.
Imperial Chemical Industries PLC: *See*—
Punja, Nazim, 4,370,346, Cl. 424-305.000.
Inaba, Naomi: *See*—
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,370,257, Cl. 252-429.00B.
Indicon Inc.: *See*—
Citrin, Paul S., 4,369,665, Cl. 73-864.180.
Ingersoll, Brian; and Hutchins, Ferris L., Jr., to Mead Corporation, The. Resilient hinge assembly for a display structure. 4,369,715, Cl. 108-2.000.
Ingersoll Milling Machine Company, The: *See*—
Goode, Keith F., 4,370,080, Cl. 409-200.000.
Inoue, Yoshio: *See*—
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,370,385, Cl. 428-429.000.
Inoue, Yukio: *See*—
Hirano, Junzo; and Inoue, Yukio, 4,370,744, Cl. 370-88.000.
Institut Francais du Petrole: *See*—
Gadelle, Claude; Burger, Jacques; and Bardon, Charles, 4,370,078, Cl. 405-264.000.
Integrated Technologies, Inc.: *See*—
Bok, Hendrik F.; and Birbara, Philip J., 4,370,356, Cl. 427-38.000.
International Business Machines Corporation: *See*—
Abolafia, Oscar R.; Ameen, Joseph G.; and Elmore, Glenn V., 4,370,197, Cl. 156-659.100.
Bohlen, Harald; Greschner, Johann; Kulcke, Werner; and Nehmiz, Peter, 4,370,554, Cl. 250-491.100.
Cason, William C.; Kuecker, Ward A.; and Stratton, Susan D., 4,370,645, Cl. 340-709.000.
Habich, Adolph B.; and Hunt, Ronald E., 4,370,071, Cl. 400-144.200.
Jones, Robert E.; and Wood, Donald H., 4,370,746, Cl. 371-27.000.
Kantor, Sherwood; Maddox, Randall A.; and Yosim, Paul S., 4,370,641, Cl. 340-146.30H.
Kogge, Peter M., 4,370,732, Cl. 364-900.000.
Reible, George A., Jr., 4,370,651, Cl. 340-825.860.
Irnich, Rudolf: *See*—
Bott, Kaspar; Kaibel, Gerd; Hoffmann, Herwig; Irnich, Rudolf; and Schaefer, Eberhard, 4,370,491, Cl. 560-234.000.
Isherwood, Jeffrey, to Crosfield Electronics Limited. Web feeding machines. 4,369,906, Cl. 226-42.000.
Ishida, Hiroshi: *See*—
Kawada, Shigeki; and Ishida, Hiroshi, 4,370,614, Cl. 324-173.000.
Ishii, Hiroshi: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiko; and Ishii, Hiroshi, 4,370,065, Cl. 368-157.000.
Ishii, Kazuo: *See*—
Tachikawa, Hiromichi; Takahashi, Yohonosuke; Ishii, Kazuo; Ikeda, Tomoaki; and Shinozaki, Fumiaki, 4,370,404, Cl. 430-302.000.
Ishikawa, Hiroyasu: *See*—
Kobayashi, Jyuro; Ito, Masanori; and Ishikawa, Hiroyasu, 4,370,579, Cl. 310-50.000.
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, to Japan Synthetic Rubber Co., Ltd. Unsaturated polyester resin compositions. 4,370,447, Cl. 525-39.000.
Isobe, Shinichi: *See*—
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,370,704, Cl. 364-171.000.
Isobe, Yukihiro: *See*—
Hosaka, Akihiko; Isobe, Yukihiro; and Okuyama, Kiyotaka, 4,370,384, Cl. 428-425.900.
Isohata, Junji; and Yamamoto, Hironori, to Canon Kabushiki Kaisha. Projection exposure apparatus. 4,370,054, Cl. 355-53.000.
Ito, Kosuke; Iida, Hiroshi; Harada, Masanori; and Hatakenaka, Masato, to Nissan Motor Co., Ltd. Exhaust gas purification control apparatus for internal combustion engine. 4,369,752, Cl. 123-568.000.
Ito, Masanori: *See*—
Kobayashi, Jyuro; Ito, Masanori; and Ishikawa, Hiroyasu, 4,370,579, Cl. 310-50.000.
Ito, Michio: *See*—
Hirayama, Kazuhiro; and Ito, Michio, 4,370,053, Cl. 355-14.00D.
Ito, Ryoichi: *See*—
Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shima, Toshio, 4,370,517, Cl. 174-74.00A.
Ito, Sumio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake air heater. 4,369,736, Cl. 123-1.00A.
Ito, Tetsuro: *See*—
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, 4,370,537, Cl. 219-69.00V.
ITW Limited: *See*—
Palmer, John P.; and McCann, Patrick J., 4,369,946, Cl. 248-74.00A.
Iura, Yukio: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,370,037, Cl. 354-23.00D.
Iwaki, Tsutomu: *See*—
Moriwaki, Yoshio; Gamou, Takaharu; Yanagihara, Nobuyuki; Yamashita, Toshio; and Iwaki, Tsutomu, 4,370,163, Cl. 420-582.000.
Iwakura, Ryoji; Nitta, Tatsuo; and Takahashi, Kazutoshi, to Citizen Watch Company Limited. Electronic timepiece with gain/loss adjustment. 4,370,067, Cl. 368-202.000.
Iwasa, Yoshio: *See*—
Umemura, Yukio; Yoshida, Isao; Taguchi, Yoshio; and Iwasa, Yoshio, 4,369,739, Cl. 123-41.740.
Iwasaki, Akira: *See*—
Nishikawa, Masao; Toshimitsu, Yoshihiko; Iwasaki, Akira; and Fujimoto, Katsuhiko, 4,369,852, Cl. 180-148.000.
Iwashita, Tomonori: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,370,037, Cl. 354-23.00D.
Iwata, Susumu; and Maruta, Keiichi, to Ricoh Company, Ltd. Thermosensitive recording adhesive label. 4,370,370, Cl. 428-40.000.
Iwata, Yasuo; and Shirai, Hisao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Outer race working method and apparatus therefor. 4,369,558, Cl. 29-148.40R.
Izu, Masatsugu; Barnard, Timothy J.; and Gattuso, David A., to Energy Conversion Devices, Inc. Cathode for generating a plasma. 4,369,730, Cl. 118-723.000.
Izumi, Eiki; Honma, Kazuo; Abe, Katsuro; Uno, Masaaki; and Nakajima, Kichio, to Hitachi Construction Machinery Co., Ltd. Drive system for construction machinery and method of controlling hydraulic circuit means thereof. 4,369,625, Cl. 60-327.000.
Izumi, Hirobumi: *See*—
Toyoda, Tsutomu; Maekawa, Iwao; Izumi, Hirobumi; and Fuzii, Tadashi, 4,370,446, Cl. 525-36.000.
J. I. Case Company: *See*—
Nudd, Barry C., 4,369,856, Cl. 180-321.000.
Shumaker, John F.; and Maurer, Herman J., 4,370,090, Cl. 414-694.000.
Jache, Harold G.: *See*—
Harris, William R.; and Jache, Harold G., 4,370,164, Cl. 420-503.000.

Jackel, Lawrence D.: *See*—
Fetter, Linus A.; Howard, Richard E.; Hu, Evelyn L.; and Jackel, Lawrence D., 4,370,359, Cl. 427-63.000.

Jackson, Allen C. Combination cigarette holder and cigarette smoke catcher. 4,369,798, Cl. 131-330.000.

Jackson, David R.; and Rushing, Allen J., to Eastman Kodak Company. Imaging apparatus adapted for developing intermittently moving webs. 4,369,732, Cl. 118-681.000.

Jackson, Thomas B.: *See*—
Houchins, Stanley L.; and Jackson, Thomas B., 4,369,532, Cl. 4-619.000.

Jacmorr Manufacturing Limited: *See*—
Fler, Jack P., 4,370,007, Cl. 312-334.000.

Jacob, Ezekiel J.: *See*—
Cooper, Sidney; and Jacob, Ezekiel J., 4,370,400, Cl. 430-126.000.

Jacobi, Haireddin; and Opitz, Wolfgang, to Troponwerke GmbH & Co. KG. S-Alkyl 3-alkylthiopropionothioate compounds, their production and their medicinal use. 4,370,342, Cl. 424-275.000.

Jaedicke, Ludwig: *See*—
Gerstenberger, Friedrich; and Jaedicke, Ludwig, 4,369,759, Cl. 124-68.000.

Jagenberg Werke AG: *See*—
Gopel, Helmut; and Klapp, Hartmut, 4,369,961, Cl. 271-10.000.
Knauthe, Joachim, 4,370,193, Cl. 156-446.000.

Jahoda, Stanislav, to Ustav pro vyzkum motorovych vozidel. Method of and apparatus for preparation of a combustion mixture for engines with divided combustion space. 4,369,747, Cl. 123-278.000.

Jakobi, Wilhelm: *See*—
Schmid, Karl; and Jakobi, Wilhelm, 4,370,203, Cl. 202-228.000.

James, Calvin E., Sr.: *See*—
Silberman, Ira J.; and James, Calvin E., Sr., 4,369,966, Cl. 272-62.000.

James, Larry R.: *See*—
Hanaway, Roger D.; and James, Larry R., 4,369,617, Cl. 56-14.600.

Jamieson, H. William, Jr., to Offset Engineering Co., Inc. Clip-on star wheel substitute. 4,369,963, Cl. 271-204.000.

Janc, Robert V.; Robins, David S.; and Retzer, Michael H., to Motorola, Inc. Apparatus and method for detecting the presence of a pulsed radio frequency signal. 4,370,748, Cl. 375-94.000.

Janicz, Thomas H., to Burlington Industries, Inc. Flexible edging of desks. 4,370,373, Cl. 428-151.000.

Janousek, Jan: *See*—
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Esner, Stanislav; Skoda, Stanislav; and Janousek, Jan, 4,369,620, Cl. 57-263.000.

Jansen, Arie: *See*—
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,370,304, Cl. 422-224.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, 4,370,447, Cl. 525-39.000.

Jarach, Roberto. Devices for numeration, overprinting, perforation and cutting on Offset sheet printing machines. 4,369,703, Cl. 101-76.000.

Jenkins, David: *See*—
Koopman, Benjamin L.; Lau, Antonio O.; Strom, Peter F.; and Jenkins, David, 4,370,418, Cl. 435-289.000.

Jensen, Gerald A.; and Merry, Ted G., to Pako Corporation. Photographic film splicer. 4,370,184, Cl. 156-157.000.

Jensen, Harbo P., to Chevron Research Company. Bisulfite sponge process. 4,370,239, Cl. 210-668.000.

Jewell, William J.: *See*—
Hayes, Thomas D.; Kabrick, Randolph M.; and Jewell, William J., 4,370,233, Cl. 210-609.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, 4,370,102, Cl. 417-296.000.

Jinnai, Koichiro; and Umezawa, Michio, to Ricoh Company, Ltd. Sheet feed apparatus for printer or the like. 4,369,964, Cl. 271-260.000.

Jochem, Cornelis M. G.: *See*—
Khoe, Giok D.; Gossink, Robert G.; and Jochem, Cornelis M. G., 4,370,021, Cl. 350-96.180.

John, Erich: *See*—
Pollak-Banda, Erich; and John, Erich, 4,369,668, Cl. 74-414.000.

John Wyeth and Brother Limited: *See*—
Crossley, Roger, 4,370,477, Cl. 542-413.000.

Johne, Hans: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,369,706, Cl. 101-365.000.

Johnson, Axel R.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; Gartside, Robert J.; and Johnson, Axel R., 4,370,303, Cl. 422-144.000.

Johnson, David E. Positive displacement engine with separate combustion chamber. 4,369,623, Cl. 60-39.600.

Johnson, Fred D.; Flasza, Michael D.; and Bretl, Wayne E., to Zenith Radio Corporation. Stabilization network for a cathode ray tube. 4,370,674, Cl. 358-74.000.

Johnson & Johnson Dental Products Company: *See*—
De Luca, Robert, 4,370,165, Cl. 106-35.000.

Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Memory controller with address independent burst mode capability. 4,370,712, Cl. 364-200.000.

Johnson, Tore R., to AMP Incorporated. Biconical optical waveguide splice. 4,370,022, Cl. 350-96.210.

Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., to Bell Telephone Laboratories, Incorporated. Endpoint detector. 4,370,521, Cl. 179-1.0SC.

Jonas, Hans: *See*—
Bieg, Hartmut; Jonas, Hans; Rosswurm, Heinz; Demmer, Wilhelm; and Dobel, Ludwig, 4,369,683, Cl. 83-157.000.

Jones, Jack D.; and Glover, Russell K., to Aircraft Dynamics Corporation. Apparatus for washing an article. 4,369,801, Cl. 134-58.00R.

Jones, Johnny O., Jr.; and White, Charles C., Jr. Waterbed vibrator. 4,370,602, Cl. 318-114.000.

Jones, Norman E. Portable rotary machining device. 4,369,679, Cl. 82-4.00R.

Jones, Robert E.; and Wood, Donald H., to International Business Machines Corporation. Memory address selector. 4,370,746, Cl. 371-27.000.

Jones, Stanley W.: *See*—
Franz, James H., Jr.; and Jones, Stanley W., 4,370,603, Cl. 318-523.000.

Jones, Thomas H., to Richardson Graphics Company. Developers for photopolymer lithographic plates. 4,370,406, Cl. 430-331.000.

Jonville, Pierre: *See*—
Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,370,394, Cl. 429-199.000.

Jorgensen, Jorgen A.; and Nygren, Donald W., to Northland Aluminum Products, Inc. Portable oven air circulator. 4,369,760, Cl. 126-21.00A.

Jorgensen, Karin D.: *See*—
Jorgensen, Klavs H.; Jorgensen, Karin D.; and Thim, Lars, 4,370,317, Cl. 424-177.000.

Jorgensen, Klavs H.; Jorgensen, Karin D.; and Thim, Lars, to Novo Industri A/S. Pancreatic spasmolytic polypeptide. 4,370,317, Cl. 424-177.000.

Joshi, David P., to Colgate-Palmolive Company. Detergent tablet. 4,370,250, Cl. 252-135.000.

Jostens Inc.: *See*—
Harris, William R.; and Jache, Harold G., 4,370,164, Cl. 420-503.000.

Judd, George G., to Martin Marietta Corporation. Preparation of pure magnesian values. 4,370,307, Cl. 423-432.000.

Juhl, Nis H.: *See*—
Marwick, Edward F.; and Juhl, Nis H., 4,370,298, Cl. 376-317.000.

Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, to Dr. Karl Thomae Gesellshaft mit beschrankter Haftung. Decapeptide. 4,370,312, Cl. 424-1.500.

Jung Products, Inc.: *See*—
Gamm, Paul B., 4,369,775, Cl. 128-166.000.

Junkermann, Helmut; and Kruger, Horst, to Degussa AG. Process for the detoxification of waste water containing phenol, phenol derivative or phenol and formaldehyde. 4,370,241, Cl. 210-759.000.

Juy, Dominique: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Kabel-und Metallwerke Gutehoffnungshuette AG: *See*—
Blumenberg, Guenther, 4,369,911, Cl. 228-173.00F.

Kaber, Stanley A.: *See*—
Leep, Ronald B.; and Kaber, Stanley A., 4,369,597, Cl. 47-9.000.

Kabrick, Randolph M.: *See*—
Hayes, Thomas D.; Kabrick, Randolph M.; and Jewell, William J., 4,370,233, Cl. 210-609.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Furuichi, Shuhei; and Suzuki, Masakazu, 4,370,752, Cl. 378-110.000.

Kabushiki Kaisha Nagasawa: *See*—
Nagasawa, Hideki, 4,370,623, Cl. 330-267.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,370,065, Cl. 368-157.000.
Nomura, Hiroaki, 4,370,069, Cl. 368-273.000.

Kadija, Igor V., to Olin Corporation. Reticulate electrode for electrolytic cells. 4,370,214, Cl. 204-242.000.

Kaeding, Warren W., to Mobil Oil Corporation. Para-selective zeolite catalysts treated with nitrogen compounds. 4,370,508, Cl. 585-467.000.

Kaganowicz, Grzegorz, to RCA Corporation. Method for mechanically preparing stylus lapping discs. 4,369,604, Cl. 51-281.00R.

Kaibel, Gerd: *See*—
Bott, Kaspar; Kaibel, Gerd; Hoffmann, Herwig; Irnich, Rudolf; and Schaefer, Eberhard, 4,370,491, Cl. 560-234.000.

Kajiwara, Toshiyuki, to Hitachi, Ltd. Rolling mill and method for rolling a sheet material. 4,369,646, Cl. 72-243.000.

Kakumoto, Hiromi; and Furukawa, Kaoru, to Matsushita Electric Works, Ltd. Charging apparatus. 4,370,606, Cl. 320-35.000.

Kakuta, Yoshiyuki: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,369,900, Cl. 222-321.000.

Kaleskas, Edward W.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,369,812, Cl. 137-843.000.

Kaloi, Cyril M., to United States of America, Navy. Electrically end coupled parasitic microstrip antennas. 4,370,657, Cl. 343-700.0MS.

Kaltbeitzer, Dieter: *See*—
Backstein, Guenter; Unger, Hans W.; Guenther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,369,709, Cl. 102-229.000.

Kamei, Seisuke; Nabetani, Hideo; and Kinoshita, Ryohei, to Fujitsu Limited. Keyboard switch and process for production thereof. 4,370,533, Cl. 200-340.000.

Kamide, Kenji; Okajima, Kunihiko; and Matsui, Toshihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Mesophase dope containing cellulose derivative and inorganic acid. 4,370,168, Cl. 106-177.000.

Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,370,248, Cl. 252-49.600.

Kampe, Wolfgang; Thiel, Max; Fauland, Erich; Bicker, Uwe; and Hebold, Gottfried, to Boehringer Mannheim GmbH. 2-Cyanoaziridinyl-(1)-2-substituted-aziridinyl-(1)-methanes. 4,370,323, Cl. 424-244.000.

Kanayama, Katsumi; Motoyama, Kazuyasu; and Furuta, Kenzi, to Olympus Optical Co., Ltd. Tape recorder with automatic tape end stopping and alarm generation. 4,370,684, Cl. 360-74.200.

Kanebo Foods, Ltd.: *See*—
Murakami, Sanpei; Kokeguchi, Sadao; Takahashi, Hiroshi; and Okada, Ken, 4,370,352, Cl. 426-557.000.

Kaneda, Yoshiyuki: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, 4,370,332, Cl. 424-258.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, 4,370,208, Cl. 204-98.000.
Uekita, Masakazu; and Abe, Masaharu, 4,370,191, Cl. 156-307.700.
Uekita, Masakazu; Fushiki, Yasuo; and Abe, Masaharu, 4,370,386, Cl. 428-458.000.

Kaneko, Kenji; and Okabe, Takahiro, to Hitachi, Ltd. Integrated injection logic amplifier and oscillator circuits. 4,370,627, Cl. 331-108.00D.

Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, to Konan Camera Research Institute. Eyeball examining device. 4,370,033, Cl. 351-206.000.

Kanno, Fukuo: *See*—
Yanase, Hiroshi; Kanno, Fukuo; and Abe, Takeshi, 4,370,292, Cl. 264-272.110.

Kano, Toshiji: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, 4,370,208, Cl. 204-98.000.

Kantor, Sherwood; Maddox, Randall A.; and Yosim, Paul S., to International Business Machines Corporation. Electronic control system. 4,370,641, Cl. 340-146.30H.

Karl O. Helm Aktiengesellschaft: *See*—
Maasbol, Alfred G., 4,370,331, Cl. 424-258.000.

Karpanty, David J.: *See*—
Burgoon, Jack L.; and Karpanty, David J., 4,369,540, Cl. 15-49.00R.

Kasahara, Katsusuke: *See*—
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, 4,370,365, Cl. 427-387.000.

Kashima Saddle Mfg. Co., Ltd.: *See*—
Kashima, Tetsuo, 4,369,999, Cl. 297-195.000.

Kashima, Tetsuo, to Kashima Saddle Mfg. Co., Ltd. Saddle for bicycle. 4,369,999, Cl. 297-195.000.

Kashiwa, Norio: *See*—
Ueda, Takashi; Minami, Syuji; Kioka, Mamoru; and Kashiwa, Norio, 4,370,455, Cl. 526-125.000.

Kasting, Edward W.; and Glasson, Richard E., to Cummins Engine Company, Inc. Internal combustion engine. 4,369,627, Cl. 60-605.000.

Kastner, Josef: *See*—
Haberl, Rainer; and Kastner, Josef, 4,370,697, Cl. 361-283.000.

Kasuga, Muneo: *See*—
Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, 4,370,055, Cl. 355-14.0SH.

Katagiri, Mikio; Sakota, Yukio; Hiroshige, Kunie; and Adachi, Yukio, to Mitsui Polychemicals Co. Ltd. Process and apparatus for producing a laminated structure composed of a substrate web and a thermoplastic resin web extrusion-coated thereon. 4,370,187, Cl. 156-244.230.

Kato Hatsujo Kaisha, Ltd.: *See*—
Shinozaki, Nobuya, 4,369,891, Cl. 220-85.0VR.

Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Method for preparing original for projection and transfer film for electrostatic photography for use in carrying out said method. 4,370,379, Cl. 428-341.000.

Katoh, Hiroshi, to Victor Company of Japan, Ltd. Tape loading apparatus in a recording and/or reproducing apparatus. 4,370,682, Cl. 360-71.000.

Katoh, Noboru; and Kimura, Akio, to Sony Corporation. Drive mechanism for tape recorder. 4,370,686, Cl. 360-96.300.

Katsuyama, Tsutomu, to Mochizuki Shoten, Limited. Combination photographing and developing apparatus. 4,370,041, Cl. 354-92.000.

Katz, Bernard B.: *See*—
Levatter, Jeffrey I., 4,370,175, Cl. 148-1.500.

Kaufman, Kurt D., to Elder Pharmaceuticals, Inc. 5'-Aminoalkyl-4'-alkylpsoralens. 4,370,344, Cl. 424-279.000.

Kawabata, Yasuziro: *See*—
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,370,258, Cl. 252-429.00R.

Kawachi, Shoji: *See*—
Nakamura, Yukiharu; and Kawachi, Shoji, 4,370,436, Cl. 524-322.000.

Kawada, Shigeki; and Ishida, Hiroshi, to Fujitsu Fanuc Limited. Speed and direction detector. 4,370,614, Cl. 324-173.000.

Kawahara, Hiroshi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,370,383, Cl. 428-425.900.

Kawamura, Katsuaki: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,370,522, Cl. 179-1.0GD.

Kawamura, Kenji: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Kawamura, Kenji; and Fukatsu, Shunzo, 4,370,318, Cl. 424-177.000.

Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, to Kabushiki Kaisha Suwa Seikosha. Step motor control mechanism for electronic timepiece. 4,370,065, Cl. 368-157.000.

Kawano, Mutsumi: *See*—
Tanaka, Katsutoshi; Takeda, Hisao; Kawano, Mutsumi; and Miyahara, Isao, 4,370,464, Cl. 528-99.000.

Kawazu, Hideyuki: *See*—
Matsuyama, Takashi; and Kawazu, Hideyuki, 4,370,051, Cl. 355-3.00R.

Kazama, Takahiko; Okamura, Yuji; and Fujita, Saburo, to Toray Industries, Inc. Process for producing polyester film. 4,370,291, Cl. 264-210.700.

Kazaoka, Kenichi; and Hattori, Takemi, to Aisin Seiki Kabushiki Kaisha. Seat for motor vehicles. 4,370,000, Cl. 297-284.000.

Keenan, John F. E.: *See*—
Clubley, Brian G.; Hyde, Thomas G.; and Keenan, John F. E., 4,370,281, Cl. 260-966.000.

Keene, Bruce C., to Honeywell Information Systems Inc. Wave form transition sequence detector. 4,370,573, Cl. 307-514.000.

Kegg, Richard L.: *See*—
Berenberg, John A.; Haggerty, William A.; Kegg, Richard L.; Schmenk, Myron J.; and Taylor, Ralph C., Jr., 4,370,721, Cl. 364-474.000.

Kelch, Heinz; and Schuh, Eduard, to Kienzle Apparate GmbH. Printing device for distance counter mechanism. 4,369,704, Cl. 101-110.000.

Kelley, Stephen H.: *See*—
Allgood, Robert N.; Kelley, Stephen H.; Ulmer, Richard W.; and Wurzburg, Henry, 4,370,632, Cl. 333-173.000.

Kelly, Frank D.: *See*—
Ghosh, Syamal K.; and Kelly, Frank D., 4,370,399, Cl. 430-58.000.

Kelly, Patrick J.; and Arcangeli, Gerald T., to McDonnell Douglas Corporation. Airbreathing propulsion system for supersonic vehicles. 4,369,940, Cl. 244-3.210.

Kelly, Timm L.: *See*—
Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., 4,370,177, Cl. 148-6.270.

Kelly, William R.; and Alvero, Ernesto J., to RCA Corporation. System and method for intermittently moving a picture tube panel on a lighthouse. 4,370,036, Cl. 354-1.000.

Kelm, Gary R.: *See*—
Chapin, Carole N.; Kelm, Gary R.; and Shelton, David L., 4,370,319, Cl. 424-184.000.

Kemeny, George A., to Westinghouse Electric Corp. Switching system for high DC current. 4,369,692, Cl. 89-8.000.

Kemeny, George A.: *See*—
Baehr, Frederick J., Jr.; Kemeny, George A.; and Barber, John P., 4,369,691, Cl. 89-8.000.

Kemper, Yves J., to Vadetec Corporation. Traction surface cooling method and apparatus. 4,369,667, Cl. 74-191.000.

Kendall Company, The: *See*—
Paul, Amy S., 4,369,527, Cl. 2-51.000.
Shah, Kishore R., 4,370,380, Cl. 428-355.000.

Kenny, Thomas C.; and Plunkett, John P., to Horizon Chemical, Inc. Fuel for compression ignition engines. 4,370,147, Cl. 44-68.000.

Kern, Calvin V., to Eltra Corporation. Starter drive assembly. 4,369,666, Cl. 74-7.00R.

Kerotest Manufacturing Corp.: *See*—
Thomas, John H., 4,369,813, Cl. 138-94.000.

Kettner, Hans; and Hutter, Odo. Device for disentangling entangled components. 4,369,874, Cl. 198-396.000.

Khoe, Giok D.; Gossink, Robert G.; and Jochem, Cornelis M. G., to U.S. Philips Corporation. Coupling element for an optical transmission fiber. 4,370,021, Cl. 350-96.180.

Khulbe, Chandra P.: *See*—
Patmore, David J.; Ranganathan, Ramaswami; Khulbe, Chandra P.; and Pruden, Barry B., 4,370,221, Cl. 208-112.000.

Kido, Takayoshi: *See*—
Tamura, Takeo; Kido, Takayoshi; and Nakamura, Tatsuo, 4,369,542, Cl. 15-250.00B.

Kiening, Hans. Method for repairing surface defects in an image or picture film. 4,370,408, Cl. 430-432.000.

Kienzle Apparate GmbH: *See*—
Kelch, Heinz; and Schuh, Eduard, 4,369,704, Cl. 101-110.000.

Kikkoman Corporation: *See*—
Okamura, Shigemichi; and Watanabe, Masazumi, 4,370,416, Cl. 435-197.000.

Kikuchi, Hiroto: *See*—
Miura, Toshikatsu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, 4,369,608, Cl. 52-309.900.

Kim, Gwan, to W. R. Grace & Co. Method of preparing supported platinum group metal catalysts. 4,370,260, Cl. 252-438.000.

Kim, Kwang Y.: *See*—
Yagi, Naoki; Kim, Kwang Y.; Nakaji, Tarushige; and Fujisaki, Kazuuki, 4,370,353, Cl. 426-570.000.

Kimball International, Inc.: *See*—
Koepke, Earl H., 4,370,002, Cl. 297-452.000.

Kimoto, Toyoki: *See*—
Watanabe, Kenkichi; Furuya, Katusuke; and Kimoto, Toyoki, 4,369,800, Cl. 133-8.00R.
Kimura, Akio: *See*—
Katoh, Noboru; and Kimura, Akio, 4,370,686, Cl. 360-96.300.
Kimura, Akira. Training aid for drilling muscles. 4,369,967, Cl. 272-119.000.
Kimura, Kenji, to Olympus Optical Company Limited. Automatic focussing system. 4,370,038, Cl. 354-25.000.
Kimura, Michiya: *See*—
Iida, Tamotsu; Enomoto, Seiji; and Kimura, Michiya, 4,370,419, Cl. 435-301.000.
Kimura, Shigeru: *See*—
Niitsu, Mitsugi; Yamazaki, Shuichi; and Kimura, Shigeru, 4,370,013, Cl. 339-82.000.
Kind Horn Company, The: *See*—
Frazer, Spencer; and Soibelman, Steven P., 4,369,857, Cl. 181-159.000.
King, John M.: *See*—
deVries, Louis; and King, John M., 4,370,246, Cl. 252-46.400.
King, Roderick V.: *See*—
Cianciolo, Cosmo J.; Snyder, John R.; and King, Roderick V., 4,369,643, Cl. 72-75.000.
Kinoshita, Hiromi; Maeda, Yoshinobu; and Tanno, Tadashi, to Matsushita Electric Industrial Co., Ltd. Lead wire forming apparatus for electric parts. 4,369,819, Cl. 140-105.000.
Kinoshita, Minoru; and Mizuta, Masaji, to Dainippon Screen Mfg. Co., Ltd. Film blackening area measuring equipment. 4,370,558, Cl. 250-559.000.
Kinoshita, Ryohei: *See*—
Kamei, Seisuke; Nabetani, Hideo; and Kinoshita, Ryohei, 4,370,533, Cl. 200-340.000.
Kinsman, Donald V.; and Luken, Clement H., Jr., to Emery Industries, Inc. Amidoamine oxides of polymeric fatty acids. 4,370,273, Cl. 260-404.500.
Kioka, Mamoru: *See*—
Ueda, Takashi; Minami, Syuji; Kioka, Mamoru; and Kashiwa, Norio, 4,370,455, Cl. 526-125.000.
Kirchev, Nikolay A.: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,370,473, Cl. 536-2.000.
Kirchhein, Albert T.: *See*—
Doniger, Jerry; Kirchhein, Albert T.; and Reynolds, Gibson, 4,370,706, Cl. 364-184.000.
Kirchner, Georg: *See*—
Straub, Willy, 4,369,969, Cl. 272-144.000.
Kirchner, Kurt; and Litzenburger, Wolfgang, to Dechema Deutsche Gesellschaft fur Chemisches Apparatewesen E V. Process for separation of traces of gaseous contaminants from waste gases by chemical absorption. 4,370,306, Cl. 423-220.000.
Kirin Beer Kabushiki Kaisha: *See*—
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,370,385, Cl. 428-429.000.
Kishi, Takao: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,369,900, Cl. 222-321.000.
Kishimoto, Kazuo: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, 4,370,208, Cl. 204-98.000.
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, to Fujisawa Pharmaceutical Co., Ltd. 1,2,3,4-Tetrahydroisoquinoline derivatives and the preparation thereof. 4,370,332, Cl. 424-258.000.
Kiss, Steven R.: *See*—
Fegley, Richard F.; and Kiss, Steven R., 4,370,140, Cl. 493-289.000.
Kita, Hiroyuki: *See*—
Hongu, Masayuki; Omuro, Shigeru; Kita, Hiroyuki; and Tokuhara, Masaharu, 4,370,676, Cl. 358-188.000.
Kitajima, Satoshi: *See*—
Shigemori, Tesshi; Nozawa, Yoshinao; Kojima, Teruhisa; and Kitajima, Satoshi, 4,369,647, Cl. 73-27.00R.
Kitamura, Masatsugu, to Victor Company of Japan, Limited. Apparatus and method for compressively approximating an analog signal. 4,370,643, Cl. 340-347.0SH.
Kitamura, Takahiko: *See*—
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Kitamura, Takahiko, 4,369,733, Cl. 118-691.000.
Kitamura, Takashi, to Canon Kabushiki Kaisha. Recording apparatus with beam scan information reading. 4,370,678, Cl. 358-285.000.
Kitrilakis, Sotiris: *See*—
Robinson, Thomas C.; and Kitrilakis, Sotiris, 4,369,530, Cl. 3-1.700.
Klapp, Hartmut: *See*—
Gopel, Helmut; and Klapp, Hartmut, 4,369,961, Cl. 271-10.000.
Klappert, Ernst: *See*—
Weingarten, Friedrich W.; Hunger, Klaus; and Klappert, Ernst, 4,370,269, Cl. 260-157.000.
Klatt, Alfred; and Singbartl, Gunther, to WABCO Fahrzeugbremsen GmbH. Electro-pneumatic control valve for pneumatic door actuator. 4,369,696, Cl. 91-465.000.
Klatt, Peter: *See*—
Hiller, Dietrich; Klatt, Peter; and Reul, Bernhard, 4,369,783, Cl. 128-260.000.
Klein, Alfons; Wedemeyer, Karlfried; and Thies, Jurgen, to Bayer Aktiengesellschaft. 1,1,3,3-Substituted hydroxyindanes. 4,370,505, Cl. 568-734.000.
Kleinhappl, Erich: *See*—
Marsoner, Hermann; and Kleinhappl, Erich, 4,369,951, Cl. 251-7.000.
Klesper, Hugo: *See*—
Busse, Oswald; and Klesper, Hugo, 4,370,232, Cl. 210-224.000.
Klibanov, Mendel S.: *See*—
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria L., legal representative, 4,369,603, Cl. 51-236.000.
Klimesch, Erich: *See*—
Meyer, Gerhard; and Klimesch, Erich, 4,370,487, Cl. 549-242.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Mercapto acid ester antioxidants for polymers. 4,370,434, Cl. 524-289.000.
Klockner-Humboldt-Deutz AG: *See*—
Abelitis, Andris, 4,370,127, Cl. 432-106.000.
Oberg, Hans-Joachim; Gruenberg, Wolf-Diethard; and Posse, Guenther, 4,369,915, Cl. 494-8.000.
Knauf, Werner: *See*—
Gildemeister, Horst; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Sachse, Burkhard, 4,370,320, Cl. 424-200.000.
Welter, Wolfgang; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Bonin, Werner, 4,370,345, Cl. 424-282.000.
Knauthe, Joachim, to Jagenberg Werke AG. Insertion of accurately positioned core tubes in winding machines. 4,370,193, Cl. 156-446.000.
Kness, Arnold A.: *See*—
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., 4,369,595, Cl. 43-83.500.
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., to Kness Manufacturing Co., Inc. Animal trap. 4,369,595, Cl. 43-83.500.
Kness Manufacturing Co., Inc.: *See*—
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., 4,369,595, Cl. 43-83.500.
Kness, Marvin E.: *See*—
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., 4,369,595, Cl. 43-83.500.
Kobayashi, Hiroaki: *See*—
Deguchi, Yukichi; Noguchi, Yukio; and Kobayashi, Hiroaki, 4,370,469, Cl. 528-388.000.
Kobayashi, Jyuro; Ito, Masanori; and Ishikawa, Hiroyasu, to Hitachi Koki Company, Limited. Power tool having a printed circuit board. 4,370,579, Cl. 310-50.000.
Koch, Gerhard: *See*—
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; and Koch, Gerhard, 4,370,244, Cl. 252-39.000.
Kocher, Helmut: *See*—
Boesenberg, Heinz; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, 4,370,489, Cl. 560-62.000.
Kochi, Hiromu: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kaneda, Yoshiyuki, 4,370,332, Cl. 424-258.000.
Kocks Technik GmbH & Company: *See*—
Brauer, Hans, 4,369,645, Cl. 72-201.000.
Koepke, Earl H., to Kimball International, Inc. Attachment for chair arm. 4,370,002, Cl. 297-452.000.
Kogge, Peter M., to International Business Machines Corporation. Skewed matrix address generator. 4,370,732, Cl. 364-900.000.
Kogiso, Takashi, to Howa Kogyo Kabushiki Kaisha. Method for simultaneously changing bobbins in a fly frame and apparatus for carrying out the method. 4,369,621, Cl. 57-267.000.
Koizumi, Kenzo: *See*—
Mitsugi, Takashi; Muneyuki, Ryonosuke; Wakisaka, Yoshiharu; Koizumi, Kenzo; and Kondo, Eiji, 4,370,414, Cl. 435-44.000.
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, to Nippon Oil Company, Ltd. Process for producing uroporphyrin III. 4,370,415, Cl. 435-119.000.
Kojima, Teruhisa: *See*—
Shigemori, Tesshi; Nozawa, Yoshinao; Kojima, Teruhisa; and Kitajima, Satoshi, 4,369,647, Cl. 73-27.00R.
Kok, Arnoldus W.: *See*—
Bosch, Gerrit; Kok, Arnoldus W.; and Giethoorn, Harmen, 4,369,567, Cl. 29-607.000.
Kokeguchi, Sadao: *See*—
Murakami, Sanpei; Kokeguchi, Sadao; Takahashi, Hiroshi; and Okada, Ken, 4,370,352, Cl. 426-557.000.
Kolarova, Mariana V.: *See*—
Garlanov, Dimo T.; Beloev, Marin G.; Hlebarov, Vladimir P.; Kolarova, Mariana V.; and Vangelov, Ivan V., 4,370,539, Cl. 219-121.0PW.
Kolts, John H.: *See*—
Eastman, Alan D.; and Kolts, John H., 4,370,259, Cl. 252-437.000.
Komeno, Yukito: *See*—
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, 4,370,365, Cl. 427-387.000.
Kommineni, Prasad R., to Westinghouse Electric Corp. Semi-flexible gas-insulated transmission line using protection tube in conductor plug-in joint. 4,370,513, Cl. 174-21.0JS.
Komoschinski, Norbert: *See*—
Papenhagen, Dieter; and Komoschinski, Norbert, 4,369,670, Cl. 74-513.000.
Komperda, Joseph. Golf club for putting. 4,369,974, Cl. 273-164.000.
Komura, Masaru: *See*—
Matsui, Toshio; and Komura, Masaru, 4,370,050, Cl. 355-3.0SH.

Konagaya, Masahiko: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,370,033, Cl. 351-206.000.
Konan Camera Research Institute: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,370,033, Cl. 351-206.000.
Kondo, Eiji: *See*—
Mitsugi, Takashi; Muneyuki, Ryonosuke; Wakisaka, Yoshiharu; Koizumi, Kenzo; and Kondo, Eiji, 4,370,414, Cl. 435-44.000.
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, to Matsushita Electric Works, Ltd. Circuit breaker. 4,370,634, Cl. 335-16.000.
Kondo, Makoto: *See*—
Hamane, Masumi; and Kondo, Makoto, 4,369,674, Cl. 74-752.00E.
Konijnenadijk, Willem L.: *See*—
Willemsen, Petrus J. M.; Konijnendijk, Willem L.; and Peters, Robert C., 4,370,595, Cl. 313-486.000.
Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Brugmans, Johannes T., 4,370,377, Cl. 428-327.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Iijima, Toshifumi; Fujimatsu, Wataru; and Onodera, Kaoru, 4,370,410, Cl. 430-505.000.
Konno, Tetsuro: *See*—
Ikeno, Hitoshi; Konno, Tetsuro; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,370,584, Cl. 310-365.000.
Koopman, Benjamin L.; Lau, Antonio O.; Strom, Peter F.; and Jenkins, David, to University of California. Liquid level control by subsurface draw off. 4,370,418, Cl. 435-289.000.
Korach, Malcolm: *See*—
Graybill, Wilmer B.; and Korach, Malcolm, 4,370,209, Cl. 204-98.000.
Korsunsky, Iosif: *See*—
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,370,012, Cl. 339-75.0MP.
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,370,017, Cl. 339-176.0MP.
Kotitschke, Ronald; and Stephan, Wolfgang, to Biotest-Serum-Institut GmbH. Method for the cold sterilization of preparations containing blood coagulation factor VIII. 4,370,264, Cl. 260-112.00B.
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method for the purification of hexamethyldisiloxane. 4,370,204, Cl. 203-39.000.
Koya, Masahiro: *See*—
Mito, Masaharu; and Koya, Masahiro, 4,370,388, Cl. 428-461.000.
Koya, Shinichi: *See*—
Suzuki, Kenpei; Koya, Shinichi; and Sato, Hiroshi, 4,370,011, Cl. 339-74.00R.
Koyama, Kazutaka: *See*—
Horii, Shigeru; Yoshikawa, Nobuhisa; and Koyama, Kazutaka, 4,370,601, Cl. 315-307.000.
Krachanov, Hristo G.: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,370,473, Cl. 536-2.000.
Krahn, Karl-Heinz. Bifilar helical electrode arrangement for transversely exciting gaseous laser media. 4,370,598, Cl. 315-59.000.
Kramer, Horst: *See*—
Uhle, Karlheinz; and Kramer, Horst, 4,369,648, Cl. 73-61.400.
Uhle, Karlheinz; and Kramer, Horst, 4,369,649, Cl. 73-61.400.
Krauss, Halina: *See*—
Krauss, Leonard; and Krauss, Halina, 4,369,948, Cl. 248-441.00A.
Krauss, Leonard; and Krauss, Halina. Disappearing book holder. 4,369,948, Cl. 248-441.00A.
Kress, Robert W. Fuel tank for model aircraft. 4,369,938, Cl. 244-135.00R.
Kricka, Larry J.: *See*—
Bunce, Roger A.; Gibbons, John E. C.; and Kricka, Larry J., 4,369,664, Cl. 73-864.120.
Kroft, David, to Control Data Corporation. Cache memory organization utilizing miss information holding registers to prevent lockup from cache misses. 4,370,710, Cl. 364-200.000.
Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, to Uni-Cardan Aktiengesellschaft. Sealing boot arrangement for a universal joint. 4,369,979, Cl. 277-212.0FB.
Kruger, Horst: *See*—
Junkermann, Helmut; and Kruger, Horst, 4,370,241, Cl. 210-759.000.
Krupp-Koppers GmbH: *See*—
Schmid, Karl; and Jakobi, Wilhelm, 4,370,203, Cl. 202-228.000.
Kruth, Jean-Pierre, to Ateliers des Charmilles, S.A. Efficiency adaptive EDM apparatus and method. 4,370,536, Cl. 219-69.00M.
Krutsch, Thomas E. Apparatus for producing a frequency change of a wage propagating signal. 4,370,654, Cl. 343-18.00D.
Kubo, Daijiro: *See*—
Nagano, Katsumi; and Kubo, Daijiro, 4,370,608, Cl. 323-316.000.
Kubozuka, Takao; and Takei, Hirofumi, to Nissan Motor Company, Limited. Low-noise level reciprocating piston internal combustion engine. 4,369,744, Cl. 123-198.00E.
Kudo, Yoshinori: *See*—
Miyanaka, Motoshi; Toudo, Kenzi; Kudo, Yoshinori; and Nakagawa, Sumio, 4,370,126, Cl. 431-73.000.
Kuecker, Ward A.: *See*—
Cason, William C.; Kuecker, Ward A.; and Stratton, Susan D., 4,370,645, Cl. 340-709.000.
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, to Canon Kabushiki Kaisha. Image developing device. 4,370,049, Cl. 355-3.0DD.
Kuki, Michio: *See*—
Shigeyasu, Motoo; and Kuki, Michio, 4,370,496, Cl. 562-487.000.
Kulcke, Werner: *See*—
Bohlen, Harald; Greschner, Johann; Kulcke, Werner; and Nehmiz, Peter, 4,370,554, Cl. 250-491.100.
Kuma, Shoji: *See*—
Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shima, Toshio, 4,370,517, Cl. 174-74.00A.
Kumazawa, Toshiharu: *See*—
Morikawa, Hiroshi; Kumazawa, Toshiharu; and Takagi, Hiroshi, 4,370,004, Cl. 308-10.000.
Kunz, Guenter O.: *See*—
Fournier, Paul J. E.; and Kunz, Guenter O., 4,369,992, Cl. 285-256.000.
Kurling, Lennart. Manually driven winch. 4,369,952, Cl. 254-353.000.
Kurose, Nancy S., to American Cyanamid Company. Compound: *d*-N-(2-amino-2-phenethyl)-2-methoxyethylamine and process for preparing the same by selective crystallization. 4,370,500, Cl. 564-304.000.
Kurze, Bernhard: *See*—
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; and Koch, Gerhard, 4,370,244, Cl. 252-39.000.
Kusch & Co., Sitzmobelwerke KG: *See*—
Desanta, Simon, 4,369,997, Cl. 297-68.000.
Kusuki, Yoshihiro: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; and Shimazaki, Hiroshi, 4,370,290, Cl. 264-184.000.
Kusumi, Katsuaki: *See*—
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,370,705, Cl. 364-184.000.
Kuwano, Fumiyoshi, to Nissan Motor Co., Ltd. Wire harness fixing assembly. 4,369,947, Cl. 248-74.00A.
Kuzenetzoff, Philip, to RCA Corporation. Resistive lens structure for electron gun. 4,370,594, Cl. 313-458.000.
Kvapil, Rudolph; and Ricketts, Thomas E., to Occidental Oil Shale, Inc. Temporary gas seal for gas level drift of an in situ oil shale retort. 4,370,003, Cl. 299-2.000.
Kyoritsu Yuki Co., Ltd.: *See*—
Tanaka, Katsutoshi; Takeda, Hisao; Kawano, Mutsumi; and Miyahara, Isao, 4,370,464, Cl. 528-99.000.
La Telemecanique Electrique: *See*—
Siffroi, Lucien, 4,370,637, Cl. 335-174.000.
LaBorde, Joseph D. Transmission system. 4,369,851, Cl. 180-6.660.
Lacombat, Michel: *See*—
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, 4,370,026, Cl. 350-163.000.
Ladek Corporation: *See*—
Lambert, Roland, 4,369,635, Cl. 62-260.000.
Lahut, Joseph A.: *See*—
Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish M., 4,370,661, Cl. 346-74.500.
Lambert, Roland, to Ladek Corporation. Subterranean heating and cooling system. 4,369,635, Cl. 62-260.000.
Lamel, Lori F.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,370,521, Cl. 179-1.0SC.
Lampeas, Steve. Retractable load carrier for vehicles. 4,369,902, Cl. 224-42.420.
Landis, Bruce J.; and Goudy, Paul R., Jr., to Landis, Kenneth J.; Landis, Bruce J.; and Goudy, Paul R., Jr. Spring biased fluid pump. 4,370,107, Cl. 417-413.000.
Landis, Bruce J.: *See*—
Goudy, Paul R., Jr., 4,369,835, Cl. 165-154.000.
Landis, Kenneth J.: *See*—
Goudy, Paul R., Jr., 4,369,835, Cl. 165-154.000.
Landis, Bruce J.; and Goudy, Paul R., Jr., 4,370,107, Cl. 417-413.000.
Landwehr, Ulrich M. Method and apparatus for photographically measuring an object. 4,370,039, Cl. 354-77.000.
Lane, Charles E., III, to Honeywell Inc. Universal terminal block connector. 4,370,018, Cl. 339-263.00R.
Lane, Mark: *See*—
Wechsler, Joseph R.; and Lane, Mark, 4,370,272, Cl. 260-404.000.
Lane, Marvin M.; and Garnett, Eric W. D., to Ag-Electron, Inc. Reflectance ratio sorting apparatus. 4,369,886, Cl. 209-564.000.
Lange, Gerhard; and Saller, Helmut, to Siemens Aktiengesellschaft. Longitudinal water-tight light waveguide cable and the method of manufacture. 4,370,023, Cl. 350-96.230.
Lange, Karl-Heinz, to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co., KG. Removable link for a carrying strap. 4,370,040, Cl. 354-288.000.
Langeluddeke, Peter: *See*—
Boesenberg, Heinz; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, 4,370,489, Cl. 560-62.000.
Langley, David T., Jr. Solar energy system. 4,370,559, Cl. 290-1.00R.
Langston, Joseph, Jr.; and Murray, Robert J., to Federal Paper Board Company, Inc. Box type carton with hinged lid. 4,369,914, Cl. 229-33.000.
Laschal Instruments Corp.: *See*—
Lasner, Jeffrey I.; and Aleixo, Francisco H., 4,369,787, Cl. 128-318.000.
Lasky, Thomas J.: *See*—
Lentz, Richard P.; Lasky, Thomas J.; and Servais, Stephen B., 4,369,660, Cl. 73-753.000.

Lasner, Jeffrey I.; and Aleixo, Francisco H., to Laschal Instruments Corp. Method of cutting a suture. 4,369,787, Cl. 128-318.000.

Lau, Antonio O.: *See—*
Koopman, Benjamin L.; Lau, Antonio O.; Strom, Peter F.; and Jenkins, David, 4,370,418, Cl. 435-289.000.

Lau, Kreisler S. Y., to Hughes Aircraft Company. Synthesis of bis-(aminophenyl) compounds. 4,370,501, Cl. 564-330.000.

Laurel Bank Machine Co., Ltd.: *See—*
Watanabe, Kenkichi; Furuya, Katusuke; and Kimoto, Toyoki, 4,369,800, Cl. 133-8.00R.

Lauterbach, Jerre F., to Cummins Engine Company. Bearing assembly for high speed shaft. 4,370,106, Cl. 417-407.000.

LaValley Industrial Plastics, Inc.: *See—*
LaValley, Richard W., 4,370,231, Cl. 210-404.000.

LaValley, Richard W., to LaValley Industrial Plastics, Inc. Rotary drum filter. 4,370,231, Cl. 210-404.000.

Lazzara, Richard C.: *See—*
Higgins, William E.; and Lazzara, Richard C., 4,370,372, Cl. 428-116.000.

Leader, Harold. Bag for explosives with lower reinforcing sleeves. 4,369,711, Cl. 102-324.000.

Lear, Anthony, to Texas Instruments Incorporated. Semiconductor switch device suitable for A.C. power control. 4,370,567, Cl. 307-252.00T.

LeBell, Clarence E.; and Barr, Samuel R., Sr., deceased (by Barr, Samuel R., Jr., administrator), to United States of America, Army. Hinging and latching apparatus. 4,369,937, Cl. 244-53.00R.

Lechner, Uwe: *See—*
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,370,327, Cl. 424-246.000.

Lederer, Edgar: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

LeDuc, Kenneth C.: *See—*
Madden, James A.; and LeDuc, Kenneth C., 4,369,570, Cl. 29-730.000.

Lee, Joseph. Clock with dual time-indicators. 4,370,063, Cl. 368-71.000.

Lee, Peter D., to Governor and Company of the Bank of England, The. Method of verification of a sheet element, such as a banknote. 4,370,057, Cl. 356-71.000.

Lee, Shaw-Guang: *See—*
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., 4,370,417, Cl. 435-212.000.

Lee, Shu M.; and Gezovich, Donald M., to Celanese Corporation. Process for the thermal stabilization of acrylic fibers. 4,370,141, Cl. 8-115.500.

Leep, Ronald B.; and Kaber, Stanley A., to Leep, Ronald B. Pelletized mint mulch and method of making. 4,369,597, Cl. 47-9.000.

Lees, Kenneth A.: *See—*
Busse, Michael J.; and Lees, Kenneth A., 4,370,322, Cl. 424-243.000.

Lefrancier, Pierre: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Legge, Ronald N.: *See—*
Rice, M. John, Jr.; and Legge, Ronald N., 4,370,288, Cl. 264-81.000.

Lehahardt, William F.; Gibson, Paul W.; and Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Fractionation and isolation of 7S and 11S protein from isoelectrically precipitated vegetable protein mixtures. 4,370,267, Cl. 260-123.500.

Leiber, Heinz, to Robert Bosch GmbH. Anti-lock control system. 4,370,715, Cl. 364-426.000.

Leipold, Dianne P., to Hercules Incorporated. Stabilized fruit suspensions and method for preparing the same. 4,370,354, Cl. 426-573.000.

Leland, John E., to Phillips Petroleum Company. Thermosetting composition combined high vinyl diolefin polymer with high vinyl low vinyl diolefin polymer. 4,370,448, Cl. 525-99.000.

Lemieux, George E., to Ford Motor Company. Automatic transmission parking brake mechanism. 4,369,867, Cl. 192-4.00A.

Lentz, Richard P.; Lasky, Thomas J.; and Servais, Stephen B., to Snap-On Tools Corporation. Electronic pressure measuring apparatus. 4,369,660, Cl. 73-753.000.

Lenz, Karl J., to Ernst Leitz Wetzlar GmbH. Method and apparatus for the determination of the axis of rotation of a circular table in multiple coordinate measuring instruments. 4,369,581, Cl. 33-169.00C.

Leontas, Spiro: *See—*
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, 4,370,006, Cl. 312-215.000.

Lerner, Leonard: *See—*
Omodei-Sale, Amedeo; Consonni, Pietro; Galliani, Giulio; and Lerner, Leonard, 4,370,336, Cl. 424-269.000.

Leroux, Marcel H., to General Electric Company. Digital thermometer having Fahrenheit and Celsius readout modes. 4,370,070, Cl. 374-170.000.

Les Fils d'Auguste Chomarat & Cie: *See—*
Curinier, Jean; and Vandermarliere, Charles, 4,369,554, Cl. 28-101.000.

Levatter, Jeffrey I., to Katz, Bernard B. Method of annealing implanted semiconductors by lasers. 4,370,175, Cl. 148-1.500.

LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeannette L. Inflatable gastric feeding tube. 4,369,789, Cl. 604-96.000.

LeVeen, Robert F.: *See—*
LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeannette L., 4,369,789, Cl. 604-96.000.

Levine, Richard S.: *See—*
Chang, Richard S.; and Levine, Richard S., 4,369,971, Cl. 273-85.00G.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,370,479, Cl. 544-278.000.

Levitt, George; and Petersen, Wallace C., to Du Pont de Nemours, E. I., and Company. Herbicidal ureas and isoureas. 4,370,480, Cl. 544-320.000.

Levy, Michel; and Poinas, Christian, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Phase noise correction circuit for a data transmission system. 4,370,749, Cl. 375-99.000.

Lewis, Benjamin G.: *See—*
Frazier, Lawrence M.; and Lewis, Benjamin G., 4,370,656, Cl. 343-112.00D.

Lewis, Charles W., to Ford Motor Company. Transmission throttle pressure regulator assembly. 4,369,677, Cl. 74-869.000.

Ley, Steven V.: *See—*
Barton, Derek H. R.; Ley, Steven V.; and Meerholz, Clive A., 4,370,497, Cl. 564-55.000.

Li, Chou H. Method for ore prospecting. 4,370,552, Cl. 250-253.000.

Liang, Samuel: *See—*
Wagner, Theodore; Vyas, Ramesh M.; and Liang, Samuel, 4,370,648, Cl. 340-825.200.

Liao, Hsiang P.; Mohr, Richard A.; and Start, John F., to FMC Corporation. Continuous process for the production of peroxycarboxylic acid compositions. 4,370,251, Cl. 252-186.420.

LIBA Maschinenfabrik GmbH: *See—*
Wunner, Roland, 4,369,639, Cl. 66-203.000.

Licentia Patent-Verwaltungs-GmbH.: *See—*
Dahlberg, Reinhard, 4,370,509, Cl. 136-244.000.
Ruff, Gunter W.; and Scheffler, Hartmut, 4,370,527, Cl. 179-70.000.

Lieb, Folker: *See—*
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,370,280, Cl. 260-465.600.

Lienhard, Paul; and Roueche, Armand, to Ciba-Geigy Corporation. Process for coloring fibre forming polyamides in the melt with azo pigments. 4,370,431, Cl. 524-100.000.

Liggett Group Inc.: *See—*
Hall, Floyd V., 4,369,796, Cl. 131-95.000.

Lindauer Dornier Gesellschaft mbH: *See—*
Gehring, Fritz; Windischbauer, Florian; and Haussler, Horst, 4,369,815, Cl. 139-57.000.

Linde Aktiengesellschaft: *See—*
Forster, Franz; and Stein, Harald, 4,370,100, Cl. 417-218.000.

Linder, Ernst: *See—*
Steinke, Leo; Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,369,748, Cl. 123-425.000.

Linder, Gerald S. Connector for endotracheal tubes and catheters. 4,369,991, Cl. 285-38.000.

List, Hans: *See—*
Marsoner, Hermann; and Kleinhappl, Erich, 4,369,951, Cl. 251-7.000.

Litzenburger, Wolfgang: *See—*
Kirchner, Kurt; and Litzenburger, Wolfgang, 4,370,306, Cl. 423-220.000.

Liu, Chung-Chiun: *See—*
Savinell, Robert F.; and Liu, Chung-Chiun, 4,370,392, Cl. 429-15.000.

Liu, En-Den D.: *See—*
O'Toole, Michael M.; Liu, En-Den D.; and Chang, Mark S., 4,370,405, Cl. 430-312.000.

Livingston, Richard D., to Du Pont de Nemours, E. I., and Company. Apparatus for finishing synthetic polymers. 4,370,061, Cl. 366-85.000.

Ljung, Bo H. G., to Singer Company, The. Piezoelectric motor for dithering ring laser gyroscopes. 4,370,583, Cl. 310-331.000.

Lockhart, Harry D. Tilling machine for sandy soil. 4,369,846, Cl. 172-60.000.

Lockwood, Lawrence B. Natural energy extractor. 4,369,629, Cl. 60-698.000.

Lofman, Bob. Vacuum responsive injection system for engines. 4,369,754, Cl. 123-573.000.

Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, to Metallgesellschaft Aktiengesellschaft. Process of electrolytically producing oxyacids of chlorine. 4,370,207, Cl. 204-95.000.

Lokken, Orvin D.: *See—*
Fisher, E. Eugene; Estes, R. Ray; Lokken, Orvin D.; and Paquette, Elmer G., 4,370,350, Cl. 426-5.000.

Lombardo, Ralph M., Jr.: *See—*
Bruce, Kenneth E.; Conway, John W.; Lombardo, Ralph M., Jr.; and Tarbox, Bruce H., 4,370,708, Cl. 364-200.000.

Lonza Ltd.: *See—*
Dinkel, Rolf, 4,370,481, Cl. 546-251.000.

Loose, Winfield W., to AMP Incorporated. Switch having switch contacts engageable directly with circuit board contacts. 4,370,529, Cl. 200-16.00D.

Lord, Steven M.; and Tabuchi, Hiroshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Method and means for increasing the maneuverability of a ship in ice-covered waters. 4,369,725, Cl. 114-40.000.

L'Oreal: *See—*
Bugaut, Andree; Thouvenin, Philippe; and Cotteret, Jean, 4,370,142, Cl. 8-407.000.

Lorenz, Kurt: *See*—
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,370,202, Cl. 202-228.000.
Loschner, Hans: *See*—
Stengl, Gerhard; and Loschner, Hans, 4,370,556, Cl. 250-503.100.
Loughridge, Frederick A.: *See*—
Bouchard, Andre C.; Hall, Harold H., Jr.; and Loughridge, Frederick A., 4,369,556, Cl. 29-25.150.
Love, Thomas L.: *See*—
Donaghue, Paul F.; Love, Thomas L.; Mitchell, Kenneth A. W.; and Pitt, Maxwell G., 4,369,689, Cl. 86-20.00C.
Loveland, Robert S.: *See*—
Whistler, Wayne J.; and Loveland, Robert S., 4,370,615, Cl. 324-457.000.
Lowenhaupt, Douglas E., to United States Steel Corporation. Process for maintaining coal proportions in a coal blend. 4,370,201, Cl. 201-1.000.
Lublin, Paul: *See*—
Pink, Francis X.; Persiani, Carmine; and Lublin, Paul, 4,370,751, Cl. 378-47.000.
Lucas Industries Limited: *See*—
Farr, Glyn P. R.; and Matthews, Colin S., 4,369,863, Cl. 188-106.00A.
Walker, Michael J., 4,370,618, Cl. 328-120.000.
Lucchi, George A., to Sperry Corporation. Control systems for radar receivers. 4,370,652, Cl. 343-5.0SM.
Luchaire S.A.: *See*—
Volan, Daniel, 4,369,610, Cl. 52-509.000.
Luh, Yuhshi: *See*—
Chen, Catherine S. H.; and Luh, Yuhshi, 4,370,243, Cl. 252-8.55D.
Luken, Clement H., Jr.: *See*—
Kinsman, Donald V.; and Luken, Clement H., Jr., 4,370,273, Cl. 260-404.500.
Lumley, Robert M., to Western Electric Company, Inc. Superconducting, fast rise-time voltage source. 4,370,568, Cl. 307-260.000.
Lummus Industries, Inc.: *See*—
Van Doorn, Donald W.; and Hawkins, James B., 4,369,681, Cl. 83-100.000.
Lunax Corporation: *See*—
Berguer, Ramon, 4,369,588, Cl. 36-9.00R.
Lund, Peter: *See*—
Rasmussen, Ole S.; and Lund, Peter, 4,369,926, Cl. 241-18.000.
Lund, Raymond R., to Canron Corporation. Spike orienter. 4,370,093, Cl. 414-779.000.
Lundberg, Robert D.: *See*—
Agarwal, Pawan K.; and Lundberg, Robert D., 4,370,432, Cl. 524-216.000.
Lundstrom, Norman H.; and Shaw, Graham C., to Thiokol Corporation. Pyrotechnic non-azide gas generants based on a non-hydrogen containing tetrazole compound. 4,370,181, Cl. 149-2.000.
Luper, Charles R., to Beckman Instruments, Inc. Gas dryer cartridge. 4,370,152, Cl. 55-281.000.
Lutze, Siegfried: *See*—
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkrant, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.
Lvov, Vladimir M.: *See*—
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.
Lwoff, Andre; Yerushalmi, Aaron; Cohen, Irun R.; Moshe, Gideon B.; and Pennell, Jack, to Yeda Research & Dev., Co., Ltd. Apparatus for treatment of the common cold and allergic rhinitis. 4,369,777, Cl. 128-200.140.
Lyonnet, Christian, to Societe de vente de L'Aluminium Pechiney. Process for the manufacture of a profile for metal joinery having a thermal gap. 4,369,562, Cl. 29-527.100.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Preuss, Friedrich, 4,369,734, Cl. 118-702.000.
Maasbol, Alfred G., to Karl O. Helm Aktiengesellschaft. L-Glaucine containing composition for cough relief. 4,370,331, Cl. 424-258.000.
Machler, Meinrad: *See*—
Trotscher, Otto; Stacklies, Horst; and Machler, Meinrad, 4,370,058, Cl. 356-125.000.
Macristy Industries, Inc.: *See*—
Swanson, Richard G., 4,369,531, Cl. 4-295.000.
Madden, James A.; and LeDuc, Kenneth C., to General Electric Company. Apparatus for inserting insulating disc in cell container. 4,369,570, Cl. 29-730.000.
Maddox, Randall A.: *See*—
Kantor, Sherwood; Maddox, Randall A.; and Yosim, Paul S., 4,370,641, Cl. 340-146.30H.
Mader, Paul. Sailboat mast. 4,369,726, Cl. 114-90.000.
Maeda, Toyoo: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Maeda, Yoshinobu: *See*—
Kinoshita, Hiromi; Maeda, Yoshinobu; and Tanno, Tadashi, 4,369,819, Cl. 140-105.000.
Maekawa, Iwao: *See*—
Toyoda, Tsutomu; Maekawa, Iwao; Izumi, Hirobumi; and Fuzii, Tadashi, 4,370,446, Cl. 525-36.000.
Magers, Wallace F.; and Foster, Donald D., to Realex Corporation. Down-locking pump. 4,369,899, Cl. 222-153.000.
Maggioni, Paolo: *See*—
Ancillotti, Francesco; Terzoni, Giuseppe; Micucci, Lidio; Maggioni, Paolo; and Panseri, Pietro, 4,370,506, Cl. 568-785.000.
Mahapatra, Santosh K.: *See*—
Panda, Jajnya D.; and Mahapatra, Santosh K., 4,370,422, Cl. 501-108.000.
Mahoney, John M.: *See*—
Holt, James L.; Mahoney, John M.; and McLeod, Kenneth M., 4,369,743, Cl. 123-196.00S.
Mahony, John E., to General Electric Company. Method and means for controlling electron beam in a raster scan monitor. 4,370,646, Cl. 340-722.000.
Mahr, Tibor G.; and Subramanian, Pallatheri M., to Du Pont de Nemours, E. I., and Company. Elastomeric film. 4,370,212, Cl. 204-159.140.
Maida, Osamu, to Nippon Kogaku K.K. Electric wind-up device of a camera. 4,370,044, Cl. 354-173.000.
Maier, Roland: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,370,327, Cl. 424-246.000.
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; and Shimazaki, Hiroshi, to Ube Industries, Ltd. Process for producing aromatic polyimide filaments. 4,370,290, Cl. 264-184.000.
Malchow, Max E., to RCA Corporation. AM Stereo receiver. 4,370,520, Cl. 179-1.0GS.
Malhotra, Satish K.: *See*—
Zedrosser, Ulrich; and Malhotra, Satish K., 4,369,593, Cl. 42-70.00F.
Malinak, Frank J. Depither. 4,369,548, Cl. 19-26.000.
Mallinckrodt, Inc.: *See*—
Furler, Alan G., 4,369,794, Cl. 128-671.000.
Malloy, Anthony J.: *See*—
Frelin, Frank J.; Kelly, Timm L.; and Malloy, Anthony J., 4,370,177, Cl. 148-6.270.
Maney, Francis J.: *See*—
Donnelly, Donald E.; and Maney, Francis J., 4,370,125, Cl. 431-66.000.
Manion, Francis M.; and Paras, Charles E., to United States of America, Army. Null balancing for fluidic sensors and amplifiers. 4,369,811, Cl. 137-819.000.
Mankey, Harry S., to Standard Manufacturing Company, Incorporated. Stabilizing jack for skid steer vehicle. 4,369,989, Cl. 280-763.000.
Manning, Gary D.: *See*—
Dain, Richard J.; Manning, Gary D.; and Burkin, Alfred R., 4,370,237, Cl. 210-638.000.
Mantoan, Dominico; and Morassi, Mario. Cable clamps. 4,369,945, Cl. 248-73.000.
Marathon Oil Company: *See*—
Tackett, James E., Jr., 4,370,238, Cl. 210-639.000.
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., to Vi po Hranitelna I Vkusova Promishlenost. Method of extracting fruit and vegetable pressings and vegetation raw materials. 4,370,473, Cl. 536-2.000.
Markham, Roger G., to Xerox Corporation. Thin body ink drop generator. 4,370,663, Cl. 346-75.000.
Marks, Bruce G.: *See*—
Hughes, Richard H.; and Marks, Bruce G., 4,370,592, Cl. 313-414.000.
Markunas, Albert L.: *See*—
Faulkner, Dennis T.; Glennon, Timothy F.; and Markunas, Albert L., 4,370,560, Cl. 290-40.00C.
Marsland, William P. System and method for removing ammonia from wastewater. 4,370,234, Cl. 210-617.000.
Marsoner, Hermann; and Kleinhappl, Erich, to List, Hans. Squeezed tube valve. 4,369,951, Cl. 251-7.000.
Martens, Walter O.: *See*—
Berkoff, William; and Martens, Walter O., 4,369,585, Cl. 34-63.000.
Martin, Jean-Francois: *See*—
Meunier, Georges; and Martin, Jean-Francois, 4,369,834, Cl. 165-104.160.
Martin Marietta Corporation: *See*—
Judd, George G., 4,370,307, Cl. 423-432.000.
Martin, Thomas F., to Rockwell International Corporation. Voltage controlled oscillator with reduced number of tuning potentiometers. 4,370,629, Cl. 331-179.000.
Maruhashi, Kenji: *See*—
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,370,415, Cl. 435-119.000.
Maruhashi, Yoshitsugu: *See*—
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, 4,370,368, Cl. 428-35.000.
Maruta, Keiichi: *See*—
Iwata, Susumu; and Maruta, Keiichi, 4,370,370, Cl. 428-40.000.
Marvin Glass & Associates: *See*—
Hicks, Alan A.; Morrison, Howard J.; Wildman, John R.; and Webb, Terry E., 4,370,064, Cl. 368-93.000.
Marwick, Edward F.; and Juhl, Nis H. Contained fission explosion breeder reactor system. 4,370,298, Cl. 376-317.000.
Masai, Hiroto, to Aisin Seiki Kabushiki Kaisha. Fan assembly for vehicles. 4,370,074, Cl. 403-388.000.
Masak, Raymond J., to United States of America, Army. Combined side lobe canceller and frequency selective limiter. 4,370,655, Cl. 343-100.0LE.

**Masaki, Kenji:** *See*—
Yamamoto, Tadahiro; and Masaki, Kenji, 4,369,650, Cl. 73-118.000.
**Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft:** *See*—
Ambrosch, Friedrich; and Schwaebel, Rudolf, 4,370,094, Cl. 415-172.00A.
Hagen, Hans, 4,369,984, Cl. 280-166.000.
**Mase, Syunzo:** *See*—
Watanabe, Tetsuo; Mase, Syunzo; and Soejima, Shigeo, 4,370,393, Cl. 429-193.000.
**Massachusetts Institute of Technology:** *See*—
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., 4,370,194, Cl. 156-643.000.
**Masuda, Tatsunosuke, to Dainippon Screen Seizo Kabushiki Kaisha.** Method and machine for positioning an object photoelectrically using a register mark. 4,370,059, Cl. 356-400.000.
**Matra:** *See*—
Amieux, Jean-Claude, 4,370,716, Cl. 364-434.000.
**Matsui, Toshihiko:** *See*—
Kamide, Kenji; Okajima, Kunihiko; and Matsui, Toshihiko, 4,370,168, Cl. 106-177.000.
**Matsui, Toshio; and Komura, Masaru, to Minolta Camera Kabushiki Kaisha.** Image transfer type copying apparatus with pre-transfer cleaning of transfer paper. 4,370,050, Cl. 355-3.0SH.
**Matsui, Yoshi.** Method of manufacturing transfer papers. 4,370,362, Cl. 427-153.000.
**Matsumoto, Goichi; and Hayakawa, Yoichi, to Aisin Warner Kabushiki Kaisha.** Torque transfer mechanism with hydraulic control system for a four wheel drive vehicle. 4,369,671, Cl. 74-665.0GA.
**Matsumoto, Kenji:** *See*—
Sato, Masamichi; Matsumoto, Kenji; and Seki, Kazuhisa, 4,370,025, Cl. 350-166.000.
Sato, Masamichi; Matsumoto, Kenji; and Naito, Shunichi, 4,370,396, Cl. 430-7.000.
**Matsumoto, Shigeyuki:** *See*—
Hara, Toshitami; and Matsumoto, Shigeyuki, 4,370,668, Cl. 346-140.00R.
**Matsumoto, Shoji:** *See*—
Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, 4,370,379, Cl. 428-341.000.
**Matsumura, Eiji:** *See*—
Suzuoka, Akihiro; Okuhira, Toshifumi; Matsumura, Eiji; and Sasaki, Katsushi, 4,370,302, Cl. 422-137.000.
**Matsuo, Masaaki:** *See*—
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,370,340, Cl. 424-274.000.
**Matsuoka, Yukinori:** *See*—
Nakajima, Osamu; Matsuoka, Yukinori; and Nakayama, Yoshiaki, 4,370,468, Cl. 528-335.000.
**Matsushita Electric Industrial Co., Ltd.:** *See*—
Horii, Shigeru; Yoshikawa, Nobuhisa; and Koyama, Kazutaka, 4,370,601, Cl. 315-307.000.
Kinoshita, Hiromi; Maeda, Yoshinobu; and Tanno, Tadashi, 4,369,819, Cl. 140-105.000.
Moriwaki, Yoshio; Gamou, Takaharu; Yanagihara, Nobuyuki; Yamashita, Toshio; and Iwaki, Tsutomu, 4,370,163, Cl. 420-582.000.
Tomimoto, Tetsuo; Nagaoka, Yoshitomi; Sasaki, Reiichi; and Oyama, Hiroshi, 4,370,673, Cl. 358-21.00R.
Wakabayashi, Noriaki; Fukumoto, Terumichi; and Ueda, Nobuhiro, 4,370,577, Cl. 310-12.000.
**Matsushita Electric Works, Ltd.:** *See*—
Fujishima, Nobuiti; Nakano, Hideharu; and Wada, Yukio, 4,370,544, Cl. 219-370.000.
Kakumoto, Hiromi; and Furukawa, Kaoru, 4,370,606, Cl. 320-35.000.
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,370,634, Cl. 335-16.000.
Nakamura, Yoshimitsu, 4,370,581, Cl. 310-198.000.
**Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Okoshi, Tokio, to Hitachi, Ltd.** Electrically insulating substrate and a method of making such a substrate. 4,370,421, Cl. 501-88.000.
**Matsushita, Yoh, to Ricoh Company, Ltd.** AC Switching device. 4,370,564, Cl. 307-140.000.
**Matsuyama Petrochemicals Inc.:** *See*—
Shigeyasu, Motoo; and Kuki, Michio, 4,370,496, Cl. 562-487.000.
**Matsuyama, Takashi; and Kawazu, Hideyuki, to Olympus Optical Company Limited.** Actuating means for separator pawl. 4,370,051, Cl. 355-3.00R.
**Mattel, Inc.:** *See*—
Chang, Richard S.; and Levine, Richard S., 4,369,971, Cl. 273-85.00G.
Sapkus, Jurgis, 4,369,690, Cl. 87-33.000.
**Matthaus, Gunther; and Ruffer, Joachim, to Siemens Aktiengesellschaft.** High-voltage bushing with double-layered potential control inserts. 4,370,514, Cl. 174-31.00R.
**Matthews, Colin S.:** *See*—
Farr, Glyn P. R.; and Matthews, Colin S., 4,369,863, Cl. 188-106.00A.
**Maublanc, Georges, to Pont-A-Mousson S.A.** Double action door closure mechanism. 4,369,545, Cl. 16-64.000.
**Mauldin, Charles H.:** *See*—
Eberly, Paul E., Jr.; Mauldin, Charles H.; and Baird, William C., Jr., 4,370,224, Cl. 208-139.000.
**Maurer, Helmut:** *See*—
Steinke, Leo; Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,369,748, Cl. 123-425.000.
**Maurer, Herman J.:** *See*—
Shumaker, John F.; and Maurer, Herman J., 4,370,090, Cl. 414-694.000.
**Maynard, Robert A., to Airco, Inc.** Rotating table positioning device with minimum backlash. 4,369,958, Cl. 269-61.000.
**McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, to Texas Instruments Incorporated.** High performance dynamic sense amplifier with active loads. 4,370,575, Cl. 307-530.000.
**McArdle, Beryl L., to General Dynamics Corporation.** Autokey generator for secret communication system. 4,370,519, Cl. 178-22.140.
**McCann, Patrick J.:** *See*—
Palmer, John P.; and McCann, Patrick J., 4,369,946, Cl. 248-74.00A.
**McCarthy, John M.** Catheter. 4,369,790, Cl. 604-280.000.
**McCarthy, Paul:** *See*—
Chou, Clifford K. F.; and McCarthy, Paul, 4,369,802, Cl. 134-122.00R.
**McCarty, John J.; and Meyer, Kerry L., to Field Electronics Inc.** Seed planter monitor. 4,369,895, Cl. 221-3.000.
**McClain, James E.; Dickson, William D.; and Scott, Howard L., to ESCO Manufacturing Company.** Method and apparatus for monitoring and controlling on line dynamic operating conditions. 4,370,098, Cl. 417-18.000.
**McCloskey, Chester M.; Fischer, James R.; and Scott, Leonard F. Germaazaspirodiones.** 4,370,485, Cl. 548-404.000.
**McCoy, Charles E., Jr.; and Crowgey, James L., to General Electric Co.** Anti-tightline control system and method for dragline type equipment. 4,370,713, Cl. 364-424.000.
**McDaniel, Grady L.** Supplemental heating system using solar radiation. 4,369,765, Cl. 126-427.000.
**McDonald, Charles A., Jr.:** *See*—
Foster, John S., Jr.; Wilson, James R.; and McDonald, Charles A., Jr., 4,370,576, Cl. 310-10.000.
**McDonald, Donald C.; Ela, Roger B.; and Pignataro, Dominic F.** Demagnetizing apparatus for a workpiece holding electromagnet. 4,370,693, Cl. 361-145.000.
**McDonnell Douglas Corporation:** *See*—
Burk, Robert C., 4,370,390, Cl. 428-614.000.
Kelly, Patrick J.; and Arcangeli, Gerald T., 4,369,940, Cl. 244-3.210.
**McGalliard, Russell L.:** *See*—
Goddin, Clifton S., Jr.; and McGalliard, Russell L., 4,370,156, Cl. 62-17.000.
**McGee, Terrill.** Eyewashing apparatus. 4,369,782, Cl. 128-249.000.
**McGovern, Stephen J.; and Yeigh, John H., Jr., to Mobil Oil Corporation.** FCC Regeneration. 4,370,222, Cl. 208-113.000.
**McLeod, Kenneth M.:** *See*—
Holt, James L.; Mahoney, John M.; and McLeod, Kenneth M., 4,369,743, Cl. 123-196.00S.
**McNally, Gordon G.:** *See*—
Allen, Kenneth R.; Allen, John K.; and McNally, Gordon G., 4,370,610, Cl. 324-52.000.
**McNeilab, Inc.:** *See*—
Mohrbacher, Richard; Ho, Winston; and Tutwiler, Gene, 4,370,343, Cl. 424-275.000.
Scott, Malcolm K., 4,370,335, Cl. 424-267.000.
**McShane, Peter F.** Portable fencing loading means. 4,370,088, Cl. 414-439.000.
**McVaugh, Arthur K.** Hand-held cable cutter. 4,369,576, Cl. 30-228.000.
**McWilliams, Donald E.:** *See*—
Barch, Herbert W.; Melle, Carl A.; McWilliams, Donald E.; and Hudson, Howard J., 4,370,157, Cl. 65-3.430.
Melle, Carl A.; McWilliams, Donald E.; and Das, Balbhadra, 4,370,439, Cl. 524-513.000.
**Mead Corporation, The:** *See*—
Ingersoll, Brian; and Hutchins, Ferris L., Jr., 4,369,715, Cl. 108-2.000.
Scranton, Robert J.; and Meckstroth, James R., 4,370,665, Cl. 346-75.000.
**Mead Johnson and Company:** *See*—
Greaney, Martin O.; and Callantine, Merritt R., 4,370,321, Cl. 424-243.000.
**Meckstroth, James R.:** *See*—
Scranton, Robert J.; and Meckstroth, James R., 4,370,665, Cl. 346-75.000.
**Medical Engineering Corporation:** *See*—
Trick, Robert E., 4,369,771, Cl. 128-79.000.
**Medtronic, Inc.:** *See*—
Friedman, Harry G., 4,369,791, Cl. 128-419.00P.
**Meerholz, Clive A.:** *See*—
Barton, Derek H. R.; Ley, Steven V.; and Meerholz, Clive A., 4,370,497, Cl. 564-55.000.
**Meile, Hanspeter, to Rieter Machine Works Ltd.** Method of levelling out variations of a fibre sliver and apparatus for implementing the method. 4,369,550, Cl. 19-240.000.
**Melle, Carl A.; McWilliams, Donald E.; and Das, Balbhadra, to PPG Industries, Inc.** Method of preparing a sizing composition for treating glass fibers. 4,370,439, Cl. 524-513.000.
**Melle, Carl A.:** *See*—
Barch, Herbert W.; Melle, Carl A.; McWilliams, Donald E.; and Hudson, Howard J., 4,370,157, Cl. 65-3.430.
**Mercer, Scott A.:** *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; and Leontas, Spiro, 4,370,006, Cl. 312-215.000.

Merli, Sergio: *See*—
Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,370,474, Cl. 536-6.400.
Merry, Ted G.: *See*—
Jensen, Gerald A.; and Merry, Ted G., 4,370,184, Cl. 156-157.000.
Merser, Claude: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.
Merten, Josef: *See*—
Grigo, Ulrich; Merten, Josef; and Binsack, Rudolf, 4,370,450, Cl. 525-262.000.
Merz & Company: *See*—
Scherm, Arthur; and Peteri, Dezsoe, 4,370,329, Cl. 424-250.000.
Scherm, Arthur; and Peteri, Dezsoe, 4,370,330, Cl. 424-250.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Schmidt, Gunther, 4,369,920, Cl. 239-127.300.
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, to BASF Aktiengesellschaft. Preparation of maleic anhydride copolymers. 4,370,454, Cl. 526-88.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,370,207, Cl. 204-95.000.
Metco Inc.: *See*—
Novinski, Edward R.; and Harrington, John H., 4,370,367, Cl. 427-423.000.
Metzger, Frederick B.: *See*—
Hanson, Donald B.; and Metzger, Frederick B., 4,370,097, Cl. 416-228.000.
Meunier, Georges; and Martin, Jean-Francois, to Tunzini-Nessi Enterprises d'Equipements. Process for recuperation of heat from a gaseous current. 4,369,834, Cl. 165-104.160.
Meyer, Gerhard; and Klimesch, Erich. Process for, respectively, the production and purification of dicarboxylic and polycarboxylic acid anhydrides. 4,370,487, Cl. 549-242.000.
Meyer, Jeffry R.: *See*—
Cookson, Alan H.; Fischer, William H.; Yoon, Kue H.; and Meyer, Jeffry R., 4,370,511, Cl. 174-14.00R.
Meyer, Kerry L.: *See*—
McCarty, John J.; and Meyer, Kerry L., 4,369,895, Cl. 221-3.000.
Meyering, Clinton: *See*—
Staver, Peter J.; and Meyering, Clinton, 4,369,793, Cl. 128-643.000.
Meyers, Stanley T. Pitch sensor. 4,369,687, Cl. 84-454.000.
Michael, Harald R., to Electrolux GmbH. Vacuum drain facility. 4,370,227, Cl. 210-170.000.
Micheletti, Arrigo. Circular knitting machines. 4,369,637, Cl. 66-8.000.
Michl, Vaclav: *See*—
Dressler, Mirko; Formanek, Vojtech; Michl, Vaclav; and Stejskal, Miroslav, 4,369,824, Cl. 144-343.000.
Micucci, Lidio: *See*—
Ancillotti, Francesco; Terzoni, Giuseppe; Micucci, Lidio; Maggioni, Paolo; and Panseri, Pietro, 4,370,506, Cl. 568-785.000.
Middleton, Marc G.: *See*—
Nelson, Richard T.; and Middleton, Marc G., 4,370,104, Cl. 417-312.000.
Midgley, Noel H. Method of forming a footwear component. 4,369,537, Cl. 12-142.0RS.
Mikami, Hidetada: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Mikulecky, Karel: *See*—
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Esner, Stanislav; Skoda, Stanislav; and Janousek, Jan, 4,369,620, Cl. 57-263.000.
Mildenberger, Hilmar: *See*—
Gildemeister, Horst; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Sachse, Burkhard, 4,370,320, Cl. 424-200.000.
Welter, Wolfgang; and Mildenberger, Hilmar, 4,370,277, Cl. 260-465.00F.
Welter, Wolfgang; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Bonin, Werner, 4,370,345, Cl. 424-282.000.
Miller, Ezra D., to Avery International Corporation. Refastenable adhesive closure for disposable diapers or briefs. 4,369,786, Cl. 604-390.000.
Miller, Gary J., to University of Florida. Method for strengthening a fractured bone. 4,369,772, Cl. 128-92.00C.
Miller, Kirby G.: *See*—
Becker, Jon; Miller, Kirby G.; and Burney, Charles F., 4,370,182, Cl. 156-52.000.
Miller, Margaret Y. Brassiere for supporting prosthesis. 4,369,792, Cl. 128-479.000.
Miller, Michael E. Rear mounted scraper for vehicles. 4,369,590, Cl. 37-231.000.
Miller, Stephen J., to Chevron Research Company. Hydrocarbon conversion process employing essentially alumina-free zeolites. 4,370,219, Cl. 208-59.000.
Miller, Stewart E., to Bell Telephone Laboratories, Incorporated. Fail-safe transmission system. 4,370,745, Cl. 371-8.000.
Millevoi, Eugenio, to Weldotron Corporation. Conveyor belt tracking. 4,369,878, Cl. 198-807.000.
Millington, Daniel R. Skewer attachment. 4,369,697, Cl. 99-351.000.
Mills, John B.; and Roberts, Christopher H., to Westland Aircraft Limited. Cable marking method and apparatus. 4,370,542, Cl. 219-121.0LH.
Milota, Lubor: *See*—
Skrdlant, Karel; and Milota, Lubor, 4,369,566, Cl. 29-597.000.
Min-Chin, Chen; and Tung-Chen, Chen. High speed two travels thread rolling machine. 4,369,644, Cl. 72-92.000.
Minami, Syuji: *See*—
Ueda, Takashi; Minami, Syuji; Kioka, Mamoru; and Kashiwa, Norio, 4,370,455, Cl. 526-125.000.
Minaminihon Rakuno Kyodo Kabushiki Kaisha: *See*—
Yagi, Naoki; Kim, Kwang Y.; Nakaji, Tarushige; and Fujisaki, Kazuaki, 4,370,353, Cl. 426-570.000.
Minamitani, Eiji; Ozawa, Kiyoo; and Yokoto, Takashi, to Fujitsu Limited. Time division electronic switching system. 4,370,742, Cl. 370-58.000.
Minnesota Automotive, Inc.: *See*—
Rettich, Thomas A.; and Woodworth, Raymond D., 4,370,714, Cl. 364-426.000.
Minnesota Mining and Manufacturing Company: *See*—
Norrell, Donald L., 4,370,650, Cl. 340-825.710.
Winslow, John M.; and Gatzke, Kenneth G., 4,370,401, Cl. 430-178.000.
Minolta Camera Kabushiki Kaisha: *See*—
Matsui, Toshio; and Komura, Masaru, 4,370,050, Cl. 355-3.0SH.
Miracle Recreation Equipment Company: *See*—
Ahrens, Paul W., 4,369,965, Cl. 272-56.50R.
Miszczyk, Janusz: *See*—
Bacal, Kazimierz; Wierusz, Lech B.; and Miszczyk, Janusz, 4,369,770, Cl. 128-69.000.
Mita Industrial Company Limited: *See*—
Kato, Mamoru; Matsumoto, Shoji; and Aizawa, Tatsuo, 4,370,379, Cl. 428-341.000.
Mitchell, Kenneth A. W.: *See*—
Donaghue, Paul F.; Love, Thomas L.; Mitchell, Kenneth A. W.; and Pitt, Maxwell G., 4,369,689, Cl. 86-20.00C.
Mito, Masaharu; and Koya, Masahiro, to Mitsui Petrochemical Industries Ltd. Laminated multilayer structure. 4,370,388, Cl. 428-461.000.
Mitschke, Karl-Heinz; and Niederprum, Hans, to Bayer Aktiengesellschaft. Use of perfluoroalkane sulphonamide salts as surface active agents. 4,370,254, Cl. 252-355.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Tanaka, Katsutoshi; Takeda, Hisao; Kawano, Mutsumi; and Miyahara, Isao, 4,370,464, Cl. 528-99.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Doi, Kunihiro; Takeyama, Tetsu; and Azuma, Keukoku, 4,370,301, Cl. 422-122.000.
Hamano, Isao; and Yabunaka, Kiyoshi, 4,369,910, Cl. 228-110.000.
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, 4,370,537, Cl. 219-69.00V.
Mitsubishi Electric Corporation: *See*—
Morikawa, Hiroshi; Kumazawa, Toshiharu; and Takagi, Hiroshi, 4,370,004, Cl. 308-10.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Gaku, Morio; and Ikeguchi, Nobuyuki, 4,370,467, Cl. 528-322.000.
Ikeguchi, Nobuyuki, 4,370,462, Cl. 528-73.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Mizunuma, Wataru, 4,369,847, Cl. 172-815.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Ogura, Toshimasa; and Sakai, Yasunosuke, 4,370,389, Cl. 428-511.000.
Mitsubishi Precision Co., Ltd.: *See*—
Morikawa, Hiroshi; Kumazawa, Toshiharu; and Takagi, Hiroshi, 4,370,004, Cl. 308-10.000.
Mitsugi, Takashi; Muneyuki, Ryonosuke; Wakisaka, Yoshiharu; Koizumi, Kenzo; and Kondo, Eiji, to Shionogi & Co., Ltd. Process for producing 6-aminopenicillanic acid and 6-aminopenicillanic acid S-oxide. 4,370,414, Cl. 435-44.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Lord, Steven M.; and Tabuchi, Hiroshi, 4,369,725, Cl. 114-40.000.
Mitsui Petrochemical Industries Ltd.: *See*—
Harada, Taira; Shimizu, Toyozi; and Nagaoka, Takenori, 4,370,502, Cl. 564-411.000.
Mito, Masaharu; and Koya, Masahiro, 4,370,388, Cl. 428-461.000.
Ueda, Takashi; Minami, Syuji; Kioka, Mamoru; and Kashiwa, Norio, 4,370,455, Cl. 526-125.000.
Mitsui Polychemicals Co. Ltd.: *See*—
Katagiri, Mikio; Sakota, Yukio; Hiroshige, Kunie; and Adachi, Yukio, 4,370,187, Cl. 156-244.230.
Miura, Takashi. Injection molding method and device. 4,370,115, Cl. 425-144.000.
Miura, Toshikatsu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, to Nissan Motor Company, Limited. Panel for automobile. 4,369,608, Cl. 52-309.900.
Miya, Kazuhiko: *See*—
Ueno, Sadayasu; Sato, Kazemasa; Oyama, Yoshishige; Nishimura, Yutaka; and Miya, Kazuhiko, 4,369,656, Cl. 73-204.000.
Miyahara, Isao: *See*—
Tanaka, Katsutoshi; Takeda, Hisao; Kawano, Mutsumi; and Miyahara, Isao, 4,370,464, Cl. 528-99.000.
Miyake, Osamu: *See*—
Nishida, Koji; and Miyake, Osamu, 4,369,722, Cl. 112-103.00.0.
Miyanaka, Motoshi; Toudo, Kenzi; Kudo, Yoshinori; and Nakagawa, Sumio, to Hitaci, Ltd. Combustion control apparatus. 4,370,126, Cl. 431-73.000.

Miyashita, Kiyoshi: *See*—
Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, 4,370,055, Cl. 355-14.0SH.

Miyashita, Yoshinori: *See*—
Shinoda, Tsutae; Yoshikawa, Kazuo; and Miyashita, Yoshinori, 4,370,599, Cl. 315-217.000.

Mizoule, Henri, to Gardel, William. Device for drawing a pattern on a support, particularly for use as a toy. 4,369,579, Cl. 33-1.00M.

Mizoule, Jacques, to Pharmindustrie. Medicament based on 2-amino-6-trifluoromethoxy-benzothiazole. 4,370,338, Cl. 424-270.000.

Mizuno, Shigeo: *See*—
Takeda, Nobuhiro; Mizuno, Shigeo; Hattori, Masaichi; and Takaishi, Yukio, 4,370,638, Cl. 335-186.000.

Mizuno, Yukio, to Nissan Motor Company Limited. Weft picking device of air jet type weaving loom. 4,369,817, Cl. 139-435.000.

Mizunuma, Wataru, to Mitsubishi Jukogyo Kabushiki Kaisha. Blade assembly. 4,369,847, Cl. 172-815.000.

Mizuta, Masaji: *See*—
Kinoshita, Minoru; and Mizuta, Masaji, 4,370,558, Cl. 250-559.000.

Mizutani, Kiyokazu: *See*—
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, 4,370,387, Cl. 428-458.000.

Mobell Blowout Services Limited: *See*—
Henson, George S.; and Brooks, Joe, 4,369,845, Cl. 166-298.000.

Mobil Oil Corporation: *See*—
Chen, Catherine S. H.; and Luh, Yuhshi, 4,370,243, Cl. 252-8.55D.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,370,248, Cl. 252-49.600.
Kaeding, Warren W., 4,370,508, Cl. 585-467.000.
McGovern, Stephen J.; and Yeigh, John H., Jr., 4,370,222, Cl. 208-113.000.
Schmitt, Kirk D., 4,370,146, Cl. 436-120.000.

Mochel, John M.: *See*—
Dynes, Robert C.; and Mochel, John M., 4,370,640, Cl. 338-25.000.

Mochizuki Shoten, Limited: *See*—
Katsuyama, Tsutomu, 4,370,041, Cl. 354-92.000.

Modular Magazine Sampling Systems, Inc.: *See*—
Schluger, Allen, 4,369,882, Cl. 206-232.000.

Moffitt, Merritt L., Jr. Utility brush. 4,370,072, Cl. 401-276.000.

Mohr, Richard A.: *See*—
Liao, Hsiang P.; Mohr, Richard A.; and Start, John F., 4,370,251, Cl. 252-186.420.

Mohrbacher, Richard; Ho, Winston; and Tutwiler, Gene, to McNeilab, Inc. Method for controlling hypertension. 4,370,343, Cl. 424-275.000.

Molins Limited: *See*—
Williamson, David T. N., 4,369,563, Cl. 29-568.000.

Mondshine, Thomas C., to Texas Brine Corporation. Well completion and work over method. 4,369,843, Cl. 166-292.000.

Monsanto Company: *See*—
Opersteny, Edward J.; and Fritzsche, Alfred K., 4,369,605, Cl. 51-319.000.

Montagu, Jean I., to General Scanning, Inc. Galvanometer with molded outer layer under hoop stress. 4,370,613, Cl. 324-154.00R.

Moody, Warren E. Dispensing gun for two-part adhesives. 4,370,062, Cl. 366-130.000.

Moon, Howard R.: *See*—
Beiswenger, John L.; Moon, Howard R.; Smiesko, Frank A.; and Chaphalkar, Dhananjay, 4,369,921, Cl. 239-317.000.

Moran, John C., to Bell Telephone Laboratories, Incorporated. Time division switching system. 4,370,743, Cl. 370-67.000.

Moranne, Jean-Pierre, to Societe Anonyme des Usines Chausson. Tube for tube-plate heat exchangers. 4,369,837, Cl. 165-175.000.

Morassi, Mario: *See*—
Mantoan, Dominico; and Morassi, Mario, 4,369,945, Cl. 248-73.000.

Morelli, Luigi: *See*—
Gregory, William D.; and Morelli, Luigi, 4,370,611, Cl. 324-61.00R.

Morgan, Harvey T., Jr.: *See*—
Phillips, Clarence W.; Eiben, Michael R.; and Morgan, Harvey T., Jr., 4,370,707, Cl. 364-269.000.

Mori, Fumio: *See*—
Ichinose, Isao; Mori, Fumio; and Suzuki, Noboru, 4,370,190, Cl. 156-307.300.

Mori, Koichi; and Nakao, Masafumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Recording material. 4,370,391, Cl. 428-697.000.

Mori, Tamotsu: *See*—
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,370,634, Cl. 335-16.000.

Mori, Yasuyuki; Nishimura, Haruo; and Sugahara, Yoshikazu, to Duskin Franchise Kabushiki Kaisha. Aromatic odorant emitting device. 4,370,300, Cl. 422-108.000.

Morikawa, Hiroshi; Kumazawa, Toshiharu; and Takagi, Hiroshi, to Mitsubishi Precision Co., Ltd.; and Mitsubishi Electric Corporation. Magnetically suspended type momentum ring assembly. 4,370,004, Cl. 308-10.000.

Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,369,924, Cl. 239-703.000.

Morishita, Teru; Sugiyama, Matuyoshi; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,369,925, Cl. 239-703.000.

Morita, Masaaki; Yamaguchi, Michio; and Asano, Hiroyuki, to Nissan Motor Co., Ltd. Cable car docking sway arrester mechanism. 4,369,714, Cl. 104-250.000.

Moriwaki, Yoshio; Gamou, Takaharu; Yanagihara, Nobuyuki; Yamashita, Toshio; and Iwaki, Tsutomu, to Matsushita Electric Industrial Company, Limited. Hydrogen storage alloy and process for making same. 4,370,163, Cl. 420-582.000.

Moriya, Kiyoshi: *See*—
Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, 4,370,279, Cl. 260-465.300.

Morozumi, Shotaro, to Tokyo Shibaura Denki Kabushiki Kaisha; and Morozumi, Shotaro. Molybdenum-based alloy. 4,370,299, Cl. 420-429.000.

Morrison, Howard J.: *See*—
Hicks, Alan A.; Morrison, Howard J.; Wildman, John R.; and Webb, Terry E., 4,370,064, Cl. 368-93.000.

Morse, Daniel R.: *See*—
Bryan, Paul J.; and Morse, Daniel R., 4,369,708, Cl. 102-202.130.

Moser, Thomas D.: *See*—
Hummert, George T.; Moser, Thomas D.; and Edison, David M., 4,370,717, Cl. 364-436.000.

Moshe, Gideon B.: *See*—
Lwoff, Andre; Yerushalmi, Aaron; Cohen, Irun R.; Moshe, Gideon B.; and Pennell, Jack, 4,369,777, Cl. 128-200.140.

Motorola, Inc.: *See*—
Allgood, Robert N.; Kelley, Stephen H.; Ulmer, Richard W.; and Wurzburg, Henry, 4,370,632, Cl. 333-173.000.
Duddles, Allen L.; and Toomey, Daniel G., 4,370,700, Cl. 361-424.000.
Ehmke, Edward L., 4,370,753, Cl. 455-36.000.
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,370,748, Cl. 375-94.000.
Rice, M. John, Jr.; and Legge, Ronald N., 4,370,288, Cl. 264-81.000.
Someshwar, Ashok H., 4,370,625, Cl. 331-49.000.

Motoyama, Kazuyasu: *See*—
Kanayama, Katsumi; Motoyama, Kazuyasu; and Furuta, Kenzi, 4,370,684, Cl. 360-74.200.

Mott, George R.: *See*—
Damouth, David E.; Mott, George R.; and Stange, Klaus K., 4,370,047, Cl. 355-3.0BE.

Moutonnier, Claude: *See*—
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plau, Bernard; and Peyronel, Jean-Francois, 4,370,478, Cl. 542-427.000.

Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, to Pierre Fabre S.A. Method of treating anxiety with 2'-(orthochlorobenzoyl)-4'-chloroglycylanilides, and compositions thereof. 4,370,347, Cl. 424-324.000.

Mta Muszaki Kemiai Kutato Intezet: *See*—
Dencs, Bela; Ormos, Zoltan; and Pataki, Karoly, 4,370,198, Cl. 159-48.100.

Mudd, Patrick J., to National Gypsum Company. Asbestos-free drywall joint compound utilizing sepiolite clay as asbestos substitute. 4,370,167, Cl. 106-119.000.

Muhr, Richard; and Schink, Karl, to Muhr und Bender. Punching and riveting machine. 4,369,907, Cl. 227-54.000.

Muhr und Bender: *See*—
Muhr, Richard; and Schink, Karl, 4,369,907, Cl. 227-54.000.

Muise, Herbert D., to Weyerhaeuser Company. Tray. 4,369,913, Cl. 229-30.000.

Muller, Karl-Heinz: *See*—
Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, 4,369,979, Cl. 277-212.0FB.

Muller, Karl W.: *See*—
Blank, Heinz U.; Wolters, Erich; Muller, Karl W.; and Rottloff, Gunter, 4,370,499, Cl. 564-200.000.

Muller, Klaus: *See*—
Steinke, Leo; Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,369,748, Cl. 123-425.000.

Mullin, Richard W.: *See*—
Sheldon, Robert W.; and Mullin, Richard W., 4,369,609, Cl. 52-478.000.

Muneyuki, Ryonosuke: *See*—
Mitsugi, Takashi; Muneyuki, Ryonosuke; Wakisaka, Yoshiharu; Koizumi, Kenzo; and Kondo, Eiji, 4,370,414, Cl. 435-44.000.

Munk, Edmund; and Huber, Helmuth, to Furnier-U. Sperrholzwerk, J. F. Werz Jr. KG. Display pallet. 4,369,716, Cl. 108-51.100.

Muntean, George; Wilson, Harry L.; and Gant, Gary L., to Cummins Engine Company, Inc. Fuel injector for internal combustion engine. 4,369,750, Cl. 123-505.000.

Murakami, Katsumi; Furuichi, Katsushi; and Honma, Toshio, to Canon Kabushiki Kaisha. Copying apparatus with detachable sorter. 4,370,052, Cl. 355-14.00R.

Murakami, Sanpei; Kokeguchi, Sadao; Takahashi, Hiroshi; and Okada, Ken, to Kanebo Foods, Ltd. Non-fried instant cooking dry noodles. 4,370,352, Cl. 426-557.000.

Murakami, Shohachi: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.

Muramatsu, Akira, to Hitachi, Ltd. Method of manufacturing a semiconductor device utilizing etch and refill to form isolation regions. 4,369,565, Cl. 29-580.000.

Murase, Isao; Hirose, Katsutoshi; and Yoneya, Shoji, to Nissan Motor Co., Ltd. Flame photometric detector analyzer. 4,370,060, Cl. 356-417.000.

Murray, Robert J.: *See*—
Langston, Joseph, Jr.; and Murray, Robert J., 4,369,914, Cl. 229-33.000.

Muscat-Tyler, Denis P.: *See*—
Greiner, Waldemar H.; and Muscat-Tyler, Denis P., 4,369,953, Cl. 256-24.000.
Myers, Claude B.: *See*—
Bruggeman, William L.; and Myers, Claude B., 4,369,607, Cl. 51-427.000.
Nabetani, Hideo: *See*—
Kamei, Seisuke; Nabetani, Hideo; and Kinoshita, Ryohei, 4,370,533, Cl. 200-340.000.
Nadia Nicoll, Societe a responsabilite limitee: *See*—
Blandin, Jean-Claude; and Richard, Louis, 4,370,186, Cl. 156-203.000.
Nagano, Katsumi; and Kubo, Daijiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Integrable conversion circuit for converting input voltage to output current or voltage. 4,370,608, Cl. 323-316.000.
Nagao, Nobuya: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,370,680, Cl. 358-330.000.
Nagaoka, Takenori: *See*—
Harada, Taira; Shimizu, Toyozi; and Nagaoka, Takenori, 4,370,502, Cl. 564-411.000.
Nagaoka, Yoshitomi: *See*—
Tomimoto, Tetsuo; Nagaoka, Yoshitomi; Sasaki, Reiichi; and Oyama, Hiroshi, 4,370,673, Cl. 358-21.00R.
Nagasawa, Hideki, to Kabushiki Kaisha Nagasawa. Push-pull amplifier circuit. 4,370,623, Cl. 330-267.000.
Nagasawa, Toshio; and Nishihara, Yoshio, to Ube Industries, Ltd. Electrical heating element. 4,370,548, Cl. 219-549.000.
Nagaura, Toru; and Aita, Takayuki, to Union Carbide Corporation. Alkaline cell. 4,370,395, Cl. 429-219.000.
Nagely, John L., to Fluid Energy Systems Corporation. High pressure gear pump or motor with axial retaining means in a housing cavity. 4,370,110, Cl. 418-132.000.
Naito, Kunji: *See*—
Igarashi, Toshiji; Nomura, Keiichi; Naito, Kunji; and Yoshida, Mikihiko, 4,370,472, Cl. 536-1.100.
Naito, Shunichi: *See*—
Sato, Masamichi; Matsumoto, Kenji; and Naito, Shunichi, 4,370,396, Cl. 430-7.000.
Nakagawa, Sumio: *See*—
Miyanaka, Motoshi; Tondo, Kenzi; Kudo, Yoshinori; and Nakagawa, Sumio, 4,370,126, Cl. 431-73.000.
Nakahira, Akitaro, to Hohyu Rubber Co., Ltd. Rubber disc for a record player turntable. 4,370,371, Cl. 428-65.000.
Nakaji, Tarushige: *See*—
Yagi, Naoki; Kim, Kwang Y.; Nakaji, Tarushige; and Fujisaki, Kazuaki, 4,370,353, Cl. 426-570.000.
Nakajima, Kichio: *See*—
Izumi, Eiki; Honma, Kazuo; Abe, Katsuro; Uno, Masaaki; and Nakajima, Kichio, 4,369,625, Cl. 60-327.000.
Nakajima, Mutsuo: *See*—
Arai, Mamoru; Hanetshi, Tatsuo; Nakajima, Mutsuo; Torikata, Akio; and Enokita, Ryuzo, 4,370,266, Cl. 260-112.50R.
Nakajima, Osamu; Matsuoka, Yukinori; and Nakayama, Yoshiaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Biaxially drawn polyhexamethylene adipamide film. 4,370,468, Cl. 528-335.000.
Nakajima, Yoshihiro: *See*—
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,370,705, Cl. 364-184.000.
Nakamura, Kousuke: *See*—
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Okoshi, Tokio, 4,370,421, Cl. 501-88.000.
Nakamura, Tatsuo: *See*—
Tamura, Takeo; Kido, Takayoshi; and Nakamura, Tatsuo, 4,369,542, Cl. 15-250.00B.
Nakamura, Tomio: *See*—
Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, 4,370,279, Cl. 260-465.300.
Nakamura, Yoshimi: *See*—
Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, 4,370,279, Cl. 260-465.300.
Nakamura, Yoshimitsu, to Matsushita Electric Works, Ltd. Multilayered coil structure. 4,370,581, Cl. 310-198.000.
Nakamura, Yukiharu; and Kawachi, Shoji, to Daikin Kogyo Co., Ltd. Process for preparing filled polytetrafluoroethylene molding powder. 4,370,436, Cl. 524-322.000.
Nakano, Hideharu: *See*—
Fujishima, Nobuiti; Nakano, Hideharu; and Wada, Yukio, 4,370,544, Cl. 219-370.000.
Nakao, Masafumi: *See*—
Mori, Koichi; and Nakao, Masafumi, 4,370,391, Cl. 428-697.000.
Nakashin, Yasushi. Apparatus for repairing leaks in underground pipe. 4,370,113, Cl. 425-13.000.
Nakatani, Yasutaka: *See*—
Nawata, Yoshiaki; Nakatani, Yasutaka; and Nakazawa, Haruki, 4,370,670, Cl. 357-36.000.
Nakayama, Yoshiaki: *See*—
Nakajima, Osamu; Matsuoka, Yukinori; and Nakayama, Yoshiaki, 4,370,468, Cl. 528-335.000.
Nakazawa, Haruki: *See*—
Nawata, Yoshiaki; Nakatani, Yasutaka; and Nakazawa, Haruki, 4,370,670, Cl. 357-36.000.
Namy, Gerald; and Cordier, Jean, to Creusot-Loire Entreprises; and Usinor. Gas diversion unit. 4,370,154, Cl. 55-309.000.
Napoleon, Jo. Cosmetic powder dispensing device. 4,369,799, Cl. 132-83.00R.
National Gypsum Company: *See*—
Mudd, Patrick J., 4,370,167, Cl. 106-119.000.
National Research Development Corporation: *See*—
Bunce, Roger A.; Gibbons, John E. C.; and Kricka, Larry J., 4,369,664, Cl. 73-864.120.
Nawata, Yoshiaki; Nakatani, Yasutaka; and Nakazawa, Haruki, to Fujitsu Limited. Transistor with plural parallel units. 4,370,670, Cl. 357-36.000.
Neel, Alan F.: *See*—
Huffman, Stanley S.; Neel, Alan F.; Swartout, Christopher A.; and Dvorak, Neil E., 4,370,723, Cl. 364-483.000.
Neeman, Ishak; and Gaffin, Stephen L., to Technion Research and Development Foundation, Ltd. Micromethod for the determination of endotoxins. 4,370,413, Cl. 435-39.000.
Nefedov, Askold I.: *See*—
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.
Nehmey, Samuel D.; and Summers, James W., to B. F. Goodrich Company, The. Chlorinated polyvinyl chloride composition. 4,370,286, Cl. 264-53.000.
Nehmiz, Peter: *See*—
Bohlen, Harald; Greschner, Johann; Kulcke, Werner; and Nehmiz, Peter, 4,370,554, Cl. 250-491.100.
Nelson, Joseph N., to Engineered Products Company. Air filter restriction indicating device. 4,369,728, Cl. 116-276.000.
Nelson, Richard T.; and Middleton, Marc G., to White Consolidated Industries, Inc. Suction muffler for refrigeration compressor. 4,370,104, Cl. 417-312.000.
Nemeth, Laszlo. Shower-sauna instantaneous electric steam or hot water supply unit. 4,370,543, Cl. 219-275.000.
Neubert, Gerhard; and Wistuba, Eckehardt, to BASF Aktiengesellschaft. Copolymers based on styrene and acrylic acid esters and/or methacrylic acid esters, and their use in gasoline-containing masonry paints or renders. 4,370,460, Cl. 526-329.200.
Neue Bruderhaus Maschinenfabrik GmbH: *See*—
Schmidt, Sylvia; Eckert, Hansdieter; Holzinger, Wolfgang; and Holle, Dietrich, 4,370,200, Cl. 162-210.000.
Neukotter, Wilhelm: *See*—
Hemfort, Heinrich; Peitzmann, August; Neukotter, Wilhelm; Pautsch, Gunthard; and Guunnewig, Hubert, 4,369,698, Cl. 99-486.000.
New Cosmos Electric Company Limited: *See*—
Shigemori, Tesshi; Nozawa, Yoshinao; Kojima, Teruhisa; and Kitajima, Satoshi, 4,369,647, Cl. 73-27.00R.
Newbould, Adrian O., to General Electric Company Limited, The. Protection apparatus for electric power transmission systems. 4,370,691, Cl. 361-62.000.
NGK Insulators, Ltd.: *See*—
Oki, Shuichiro; and Watanabe, Tetsuo, 4,370,213, Cl. 204-195.00S.
Watanabe, Tetsuo; Mase, Syunzo; and Soejima, Shigeo, 4,370,393, Cl. 429-193.000.
Nibby, Chester M., Jr.: *See*—
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,370,712, Cl. 364-200.000.
Nibi, Lordana: *See*—
Sannipoli, Anna M.; Nibi, Lordana; and Saldi, Giorgio, 4,369,869, Cl. 192-131.00R.
Nicolon Corporation: *See*—
Scales, John M., 4,370,075, Cl. 405-20.000.
Niederprum, Hans: *See*—
Mitschke, Karl-Heinz; and Niederprum, Hans, 4,370,254, Cl. 252-355.000.
Nielsen, Erik S.; and Stacker, Poul, to I. Bager & Co. A/S. Cable stranding machine. 4,369,619, Cl. 57-58.340.
Nielsen, Raymond E., to Honeywell Information Systems Inc. Detector for time difference between transitions in two wave forms. 4,370,574, Cl. 307-514.000.
Niemiec, John J.: *See*—
Hein, James R.; Herr, Wayne T., Sr.; Niemiec, John J.; and Dombrowski, Philip, 4,369,982, Cl. 280-47.13R.
Niesse, Paul J., to Western Electric Company, Inc. Methods of and apparatus for coating lightguide fiber. 4,370,355, Cl. 427-9.000.
Nifco, Inc.: *See*—
Niitsu, Mitsugi; Yamazaki, Shuichi; and Kimura, Shigeru, 4,370,013, Cl. 339-82.000.
Yuda, Takuo, 4,369,553, Cl. 24-230.00R.
Niitsu, Mitsugi; Yamazaki, Shuichi; and Kimura, Shigeru, to Honda Giken Kogyo Kabushiki Kaisha; and Nifco, Inc. Connector device for electric circuit. 4,370,013, Cl. 339-82.000.
Nijman, Aloysius J.: *See*—
Schoofs, Franciscus A. C. M.; Nijman, Aloysius J.; and van Doorgen, Frederik, 4,370,526, Cl. 179-51.0AA.
Nijs, Marc, to N.V. Bekaert S.A. Reinforcing strip. 4,369,941, Cl. 245-2.000.
Nikkel, Ronnie D., to Phillips Petroleum Company. Yarn processing apparatus. 4,369,555, Cl. 28-221.000.
Nikov, Nikolay Y.: *See*—
Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., 4,369,919, Cl. 239-79.000.
Nilarp, Anders: *See*—
Eriksson, Gunno; and Nilarp, Anders, 4,370,671, Cl. 357-79.000.

Nilsson, Nils-Ake. Multiple wheel tire with reduced noise. 4,369,825, Cl. 152-157.000.

Nippon Kinzoku Co., Ltd.: *See*—
Yoshihara, Tsuyoshi; and Ohashi, Nobuaki, 4,370,210, Cl. 204-140.000.

Nippon Kogaku K.K.: *See*—
Fukuhara, Toru; and Utagawa, Ken, 4,370,551, Cl. 250-201.000.
Maida, Osamu, 4,370,044, Cl. 354-173.000.
Nohda, Masao, 4,370,034, Cl. 351-206.000.
Ohkubo, Yuji, 4,370,042, Cl. 354-127.000.
Sato, Masatoshi; and Takahashi, Yosuke, 4,370,027, Cl. 350-164.000.

Nippon Oil Company, Ltd.: *See*—
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,370,415, Cl. 435-119.000.
Omika, Hiroyoshi; Hara, Hajime; Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,370,453, Cl. 525-450.000.

Nippon Steel Corporation: *See*—
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, 4,370,387, Cl. 428-458.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Hirano, Junzo; and Inoue, Yukio, 4,370,744, Cl. 370-88.000.

Nishida, Koji; and Miyake, Osamu, to Aisin Seiki Kabushiki Kaisha. Control system for a plurality of embroidery sewing machines. 4,369,722, Cl. 112-103.000.

Nishihara, Yoshio: *See*—
Nagasawa, Toshio; and Nishihara, Yoshio, 4,370,548, Cl. 219-549.000.

Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Muneo, to Olympus Optical Company Limited. Duplicating system comprising electrophotographic copying apparatus and option device. 4,370,055, Cl. 355-14.0SH.

Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Power steering apparatus for vehicle. 4,369,695, Cl. 91-375.00A.

Nishikawa, Masao; Toshimitsu, Yoshihiko; Iwasaki, Akira; and Fujimoto, Katsuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Power steering apparatus for vehicles. 4,369,852, Cl. 180-148.000.

Nishimura, Haruo: *See*—
Mori, Yasuyuki; Nishimura, Haruo; and Sugahara, Yoshikazu, 4,370,300, Cl. 422-108.000.

Nishimura, Yutaka: *See*—
Ueno, Sadayasu; Sato, Kanemasa; Oyama, Yoshishige; Nishimura, Yutaka; and Miya, Kazuhiko, 4,369,656, Cl. 73-204.000.

Nissan Motor Company, Limited: *See*—
Anzai, Makoto, 4,369,757, Cl. 123-620.000.
Chiba, Akio; and Funahashi, Jun, 4,369,981, Cl. 280-5.00A.
Endo, Hiroshi, 4,369,758, Cl. 123-620.000.
Ezoe, Mitsuhiko, 4,369,756, Cl. 123-620.000.
Ito, Kosuke; Iida, Hiroshi; Harada, Masanori; and Hatakenaka, Masato, 4,369,752, Cl. 123-568.000.
Kubozuka, Takao; and Takei, Hirofumi, 4,369,744, Cl. 123-198.00E.
Kuwano, Fumiyoshi, 4,369,947, Cl. 248-74.00A.
Miura, Toshikatsu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, 4,369,608, Cl. 52-309.900.
Mizuno, Yukio, 4,369,817, Cl. 139-435.000.
Morita, Masaaki; Yamaguchi, Michio; and Asano, Hiroyuki, 4,369,714, Cl. 104-250.000.
Murase, Isao; Hirose, Katsutoshi; and Yoneya, Shoji, 4,370,060, Cl. 356-417.000.
Ohtsuka, Kunio, 4,369,672, Cl. 74-688.000.
Okamoto, Hisao; and Fukuma, Daizo, 4,369,710, Cl. 102-289.000.
Saito, Masaaki, 4,369,755, Cl. 123-588.000.
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, 4,370,102, Cl. 417-296.000.
Sunohara, Yoshio; and Ohtsuka, Kunio, 4,369,865, Cl. 192-3.310.
Tamura, Takeo; Kido, Takayoshi; and Nakamura, Tatsuo, 4,369,542, Cl. 15-250.00B.
Umemura, Yukio; Yoshida, Isao; Taguchi, Yoshio; and Iwasa, Yoshio, 4,369,739, Cl. 123-41.740.
Watanabe, Takeaki, 4,369,978, Cl. 277-12.000.
Yamamoto, Tadahiro; and Masaki, Kenji, 4,369,650, Cl. 73-118.000.
Yokoyama, Junichi, 4,370,282, Cl. 261-34.00B.

Nissin Kogyo Kabushiki Kaisha: *See*—
Seki, Masayuki, 4,369,862, Cl. 188-73.450.

Nitta, Tatsuo: *See*—
Iwakura, Ryoji; Nitta, Tatsuo; and Takahashi, Kazutoshi, 4,370,067, Cl. 368-202.000.

Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, 4,370,279, Cl. 260-465.300.

Nixon, Henry M.: *See*—
DeCaro, Aristide R.; and Nixon, Henry M., 4,370,589, Cl. 313-315.000.

NL Industries, Inc.: *See*—
Scearce, Forest A., 4,369,655, Cl. 73-153.000.

Noda, Atsushi; and Hanagata, Takayoshi, to Canon Kabushiki Kaisha. Thermal head driving device. 4,370,666, Cl. 346-76.0PH.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,369,930, Cl. 242-84.10J.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel clutch control mechanism. 4,369,936, Cl. 242-220.000.

Noda, Tomimitsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Microwave oven power control system. 4,370,535, Cl. 219-10.55B.

Noguchi, Yukio: *See*—
Deguchi, Yukichi; Noguchi, Yukio; and Kobayashi, Hiroaki, 4,370,469, Cl. 528-388.000.

Nohda, Masao, to Nippon Kogaku K.K. Ophthalmological instrument of continuously variable magnification. 4,370,034, Cl. 351-206.000.

Nomura, Hiroaki, to Kabushiki Kaisha Sewa Seikosha. Electronic alarm timepiece. 4,370,069, Cl. 368-273.000.

Nomura, Keiichi: *See*—
Igarashi, Toshiji; Nomura, Keiichi; Naito, Kunji; and Yoshida, Mikihiko, 4,370,472, Cl. 536-1.100.

Nordeen, Erwin E., to Whirlpool Corporation. Powered floor sweeper. 4,369,539, Cl. 15-49.00C.

Noren, Tore H. Vacuum breaker and mixing chamber. 4,369,806, Cl. 137-216.000.

Norrell, Donald L., to Minnesota Mining and Manufacturing Company. Tone detection circuitry. 4,370,650, Cl. 340-825.710.

Norris, Amos; and Dorius, Edwin J. Method and apparatus for a portable respirator. 4,369,778, Cl. 128-205.130.

Norris Industries, Inc.: *See*—
Grell, Gary J., 4,369,642, Cl. 70-389.000.

Northern Telecom Limited: *See*—
Vallee, Guy, 4,370,639, Cl. 337-230.000.

Northland Aluminum Products, Inc.: *See*—
Jorgensen, Jorgen A.; and Nygren, Donald W., 4,369,760, Cl. 126-21.00A.

Norwich Eaton Pharmaceuticals, Inc.: *See*—
Wright, George C.; and White, Ronald E., 4,370,494, Cl. 562-450.000.

Notelteirs, Victor R., to U.S. Philips Corporation. Lamp/reflector unit. 4,370,587, Cl. 313-113.000.

Novinski, Edward R.; and Harrington, John H., to Metco Inc. Self-bonding flame spray wire for producing a readily grindable coating. 4,370,367, Cl. 427-423.000.

Novo Industri A/S: *See*—
Jorgensen, Klavs H.; Jorgensen, Karin D.; and Thim, Lars, 4,370,317, Cl. 424-177.000.

Novum in Elettrodomestica Srl: *See*—
Parisi, Sebastiano, 4,369,544, Cl. 15-320.000.

Nozawa, Yoshinao: *See*—
Shigemori, Teshi; Nozawa, Yoshinao; Kojima, Teruhisa; and Kitajima, Satoshi, 4,369,647, Cl. 73-27.00R.

Npk za Kontrolno Zavarachni Raboti: *See*—
Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., 4,369,919, Cl. 239-79.000.
Garlanov, Dimo T.; Beloev, Marin G.; Hlebarov, Vladimir P.; Kolarova, Mariana V.; and Vangelov, Ivan V., 4,370,539, Cl. 219-121.0PW.

Nudd, Barry C., to J. I. Case Company. Backhoe control with hand throttle and electric throttle control. 4,369,856, Cl. 180-321.000.

N.V. Bekaert S.A.: *See*—
Nijs, Marc, 4,369,941, Cl. 245-2.000.

Nygren, Donald W.: *See*—
Jorgensen, Jorgen A.; and Nygren, Donald W., 4,369,760, Cl. 126-21.00A.

Nypro Inc.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,369,812, Cl. 137-843.000.

Oakes, Billy D., to Dow Chemical Company, The. Corrosion inhibitor for aluminum in aqueous acids. 4,370,256, Cl. 252-391.000.

Oberg, Hans-Joachim; Gruenberg, Wolf-Diethard; and Posse, Guenther, to Klockner-Humboldt-Deutz AG. Method and apparatus for regulating the differential rpm of two rotating parts. 4,369,915, Cl. 494-8.000.

Occidental Chemical Corporation: *See*—
Dannels, W. Andrew; and Bainbridge, Robert W., 4,370,122, Cl. 425-543.000.
Dannels, W. Andrew; and Bainbridge, Robert W., 4,370,123, Cl. 425-543.000.

Occidental Oil Shale, Inc.: *See*—
Cha, Chang Y., 4,369,841, Cl. 166-251.000.
Cha, Chang Y., 4,369,842, Cl. 166-251.000.
Kvapil, Rudolph; and Ricketts, Thomas E., 4,370,003, Cl. 299-2.000.

Odell, Eugene I. Mechanical torque converter. 4,369,673, Cl. 74-751.000.

Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, to Bayer Aktiengesellschaft. Phosphonohydroxyacetonitrile, a process for its preparation and its use as an intermediate product for the preparation of medicaments. 4,370,280, Cl. 260-465.600.

Offset Engineering Co., Inc.: *See*—
Jamieson, H. William, Jr., 4,369,963, Cl. 271-204.000.

Offutt, Elmer B.; Babich, Edward; and Gillett, William G., to Fawn Engineering Corp. Product storing and dispensing apparatus. 4,369,897, Cl. 221-227.000.

Ogasawara, Takahisa: *See*—
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, 4,370,387, Cl. 428-458.000.

Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, to Agency of Industrial Science & Technology. Catalyst system for hydroformylation of olefins. 4,370,258, Cl. 252-429.00R.

Ogawa, Tadao; and Yamaguchi, Nobuhide, to Fujitsu Limited. Low noise amplifier circuit with reduced low-frequency gain. 4,370,624, Cl. 330-294.000.

Ogihara, Yutaka: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,370,680, Cl. 358-330.000.
Ogura, Toshimasa; and Sakai, Yasunosuke, to Mitsubishi Paper Mills, Ltd. Coated paper of improved printability. 4,370,389, Cl. 428-511.000.
Ohara, Yuji; and Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser recorder. 4,370,667, Cl. 346-108.000.
Oharek, Frank J.: *See*—
Baldwin, Dorothy M.; Oharek, Frank J.; and Stahl, Curt, 4,370,677, Cl. 358-225.000.
Ohashi, Nobuaki: *See*—
Yoshihara, Tsuyoshi; and Ohashi, Nobuaki, 4,370,210, Cl. 204-140.000.
Ohashi, Toshinori: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Ohkubo, Masaharu: *See*—
Shigenobu, Michio; and Ohkubo, Masaharu, 4,369,729, Cl. 118-60.000.
Ohkubo, Yuji, to Nippon Kogaku K.K. Ready-to-flash condition indicating device for a camera. 4,370,042, Cl. 354-127.000.
Ohme, Dale A. Connector hub for geodesic dome structures. 4,370,073, Cl. 403-172.000.
Ohnishi, Masahiro: *See*—
Ohara, Yuji; and Ohnishi, Masahiro, 4,370,667, Cl. 346-108.000.
Ohno, Ryotaro: *See*—
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, 4,370,447, Cl. 525-39.000.
Ohtsuka, Kunio, to Nissan Motor Company, Limited. Change-speed transmission with selective bypass of hydrokinetic unit. 4,369,672, Cl. 74-688.000.
Ohtsuka, Kunio: *See*—
Sunohara, Yoshio; and Ohtsuka, Kunio, 4,369,865, Cl. 192-3.310.
Oida, Yoshio: *See*—
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, 4,370,731, Cl. 364-900.000.
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge machine. 4,370,537, Cl. 219-69.00V.
Ojima, Iwao; and Fuchikami, Takamasa, to Sagami Chemical Research Center. Process for producing perfluorocarbon group-containing aidehydes. 4,370,504, Cl. 568-454.000.
Oka, Joji: *See*—
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshitsu, 4,370,387, Cl. 428-458.000.
Okabe, Takahiro: *See*—
Kaneko, Kenji; and Okabe, Takahiro, 4,370,627, Cl. 331-108.00D.
Okada, Ken: *See*—
Murakami, Sanpei; Kokeguchi, Sadao; Takahashi, Hiroshi; and Okada, Ken, 4,370,352, Cl. 426-557.000.
Okada, Yukio: *See*—
Miura, Toshikatsu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, 4,369,608, Cl. 52-309.900.
Okajima, Kunihiko: *See*—
Kamide, Kenji; Okajima, Kunihiko; and Matsui, Toshihiko, 4,370,168, Cl. 106-177.000.
Okamoto, Hisao; and Fukuma, Daizo, to Nissan Motor Company, Ltd. End-burning gas-generating composition grain containing intertwisted wires. 4,369,710, Cl. 102-289.000.
Okamoto, Miyoshi; and Asada, Miyozo, to Toray Industries, Inc. Spinneret assembly for use in production of multi-ingredient multi-core composite filaments. 4,370,114, Cl. 425-131.500.
Okamura, Shigemichi; and Watanabe, Masazumi, to Kikkoman Corporation. Hydroxy-cinnamic acid ester hydrolase and process for producing same. 4,370,416, Cl. 435-197.000.
Okamura, Yuji: *See*—
Kazama, Takahiko; Okamura, Yuji; and Fujita, Saburo, 4,370,291, Cl. 264-210.700.
Okazaki, Sakiho: *See*—
Kawamura, Yoshikazu; Hosokawa, Minoru; Okazaki, Sakiho; and Ishii, Hiroshi, 4,370,065, Cl. 368-157.000.
Oki, Shuichiro; and Watanabe, Tetsuo, to NGK Insulators, Ltd. Oxygen sensor. 4,370,213, Cl. 204-195.00S.
Okoshi, Tokio: *See*—
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Okoshi, Tokio, 4,370,421, Cl. 501-88.000.
Okuhira, Toshifumi: *See*—
Suzuoka, Akihiro; Okuhira, Toshifumi; Matsumura, Eiji; and Sasaki, Katsushi, 4,370,302, Cl. 422-137.000.
Okuyama, Kiyotaka: *See*—
Hosaka, Akihiko; Isobe, Yukihiro; and Okuyama, Kiyotaka, 4,370,384, Cl. 428-425.900.
Olin Corporation: *See*—
Gray, Thomas J., 4,370,361, Cl. 427-123.000.
Kadija, Igor V., 4,370,214, Cl. 204-242.000.
Pryor, Michael J.; and Tyler, Derek E., 4,369,832, Cl. 164-472.000.
Oliver, Jean E.: *See*—
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., 4,370,349, Cl. 424-365.000.
Olson, Allan H.: *See*—
Gangal, Subhash V.; and Olson, Allan H., 4,370,376, Cl. 428-241.000.
Olympus Optical Co., Ltd.: *See*—
Kanayama, Katsumi; Motoyama, Kazuyasu; and Furuta, Kenzi, 4,370,684, Cl. 360-74.200.
Kimura, Kenji, 4,370,038, Cl. 354-25.000.
Matsuyama, Takashi; and Kawazu, Hideyuki, 4,370,051, Cl. 355-3.00R.
Nishikawa, Masaji; Miyashita, Kiyoshi; and Kasuga, Museo, 4,370,055, Cl. 355-14.0SH.
Shishido, Yoshio, 4,369,767, Cl. 128-6.000.
Tomizawa, Yoshio, 4,370,549, Cl. 235-92.0MP.
Omika, Hiroyoshi; Hara, Hajime; Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, to Nippon Oil Company, Ltd. Process for preparing cathodic electrodepositable coating composition. 4,370,453, Cl. 525-450.000.
Omodei-Sale, Amedeo; Consonni, Pietro; Galliani, Giulio; and Lerner, Leonard, to Gruppo Lepetit S.p.A. 3,5-Disubstituted-1H-1,2,4-triazole derivatives as antifertility agents. 4,370,336, Cl. 424-269.000.
Omodei-Sale', Amedeo; Consonni, Pietro; and Galliani, Giulio, to Gruppo Lepetit S.p.A. 1,2,4-Triazole derivatives as antifertility agents and pharmaceutical compositions containing them. 4,370,337, Cl. 424-269.000.
Omron Tateisi Electronics Co.: *See*—
Yamanaka, Takeshi, 4,369,935, Cl. 242-192.000.
Omuro, Shigeru: *See*—
Hongu, Masayuki; Omuro, Shigeru; Kita, Hiroyuki; and Tokuhara, Masaharu, 4,370,676, Cl. 358-188.000.
Ono, Noboru: *See*—
Kani, Kazutaka; Abe, Kuniomi; Konagaya, Masahiko; and Ono, Noboru, 4,370,033, Cl. 351-206.000.
Onodera, Kaoru: *See*—
Iijima, Toshifumi; Fujimatsu, Wataru; and Onodera, Kaoru, 4,370,410, Cl. 430-505.000.
Opelika Manufacturing Corporation: *See*—
Griffith, William C., Jr.; and Brocklehurst, Charles E., 4,369,723, Cl. 112-281.000.
Opersteny, Edward J.; and Fritzsche, Alfred K., to Monsanto Company. Methods for preparing tube sheets for permeators having hollow fiber membranes. 4,369,605, Cl. 51-319.000.
Opitz, Wolfgang: *See*—
Jacobi, Haireddin; and Opitz, Wolfgang, 4,370,342, Cl. 424-275.000.
Optical Coating Laboratory, Inc.: *See*—
Small, Edward A.; Edwards, Richard H.; Eufusia, Eugene A.; Clary, Robert M.; and Bergfelt, Nils H., 4,369,876, Cl. 198-460.000.
Ordmandy, Robert L. Quick change multiple function outlet. 4,370,010, Cl. 339-31.00R.
Orem, Michael W.: *See*—
Cruikshank, Susan J.; and Orem, Michael W., 4,370,412, Cl. 430-635.000.
Orissa Cement Limited: *See*—
Panda, Jajnya D.; and Mahapatra, Santosh K., 4,370,422, Cl. 501-108.000.
Ormos, Zoltan: *See*—
Dencs, Bela; Ormos, Zoltan; and Pataki, Karoly, 4,370,198, Cl. 159-48.100.
Ornberg, Stellan. Basic frame for an adjustable damper-actuated chair. 4,370,001, Cl. 297-355.000.
Orndorff, Steve A., to Westvaco Corporation. Enzymatic catalyzed biocide system. 4,370,199, Cl. 162-161.000.
Ortho Pharmaceutical Corporation: *See*—
Shriver, David A., 4,370,348, Cl. 424-331.000.
Orthoefer, Frank T.: *See*—
Lehnhardt, William F.; Gibson, Paul W.; and Orthoefer, Frank T., 4,370,267, Cl. 260-123.500.
Oshime, Yasuhiro: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,370,522, Cl. 179-1.0GD.
Ostrowsky, Efrem M., to Ethyl Products Company. Tamperproof closure. 4,369,889, Cl. 215-246.000.
Ostyn, Marcel A., to Exxon Research and Engineering Co. Gear and axle oil composition. 4,370,247, Cl. 252-46.700.
O'Toole, Michael M.; Liu, En-Den D.; and Chang, Mark S., to Hewlett-Packard Company. Multilayer photoresist process utilizing an absorbant dye. 4,370,405, Cl. 430-312.000.
Otsuki, Yutaka: *See*—
Omika, Hiroyoshi; Hara, Hajime; Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,370,453, Cl. 525-450.000.
Otterbein, Karl: *See*—
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.
Otty, Malcolm. Method and apparatus for insulating coils for rotary electric machines. 4,370,188, Cl. 156-245.000.
Outboard Marine Corporation: *See*—
Holt, James L.; Mahoney, John M.; and McLeod, Kenneth M., 4,369,743, Cl. 123-196.00S.
Owens-Corning Fiberglas Corporation: *See*—
Roberts, Michael G.; and Tanner, Joseph F., 4,370,435, Cl. 524-312.000.
Owens-Illinois, Inc.: *See*—
Uhlig, Albert R., 4,369,892, Cl. 220-320.000.
Oy Nokia AB: *See*—
Riekkinen, Asko S.; and Ronneberg, Allan F., 4,369,928, Cl. 242-25.00A.

Oy Tampella Ab: *See*—
Salmi, Pekka; and Helin, Aimo, 4,369,848, Cl. 173-8.000.
Oy Wartsila Ab: *See*—
Heijola, Pentti; and Burmeister, Fredrik, 4,369,853, Cl. 180-117.000.
Oyama, Hiroshi: *See*—
Tomimoto, Tetsuo; Nagaoka, Yoshitomi; Sasaki, Reiichi; and Oyama, Hiroshi, 4,370,673, Cl. 358-21.00R.
Oyama, Yoshishige: *See*—
Ueno, Sadayasu; Sato, Kanemasa; Oyama, Yoshishige; Nishimura, Yutaka; and Miya, Kazuhiko, 4,369,656, Cl. 73-204.000.
Ozawa, Kiyoo: *See*—
Minamitani, Eiji; Ozawa, Kiyoo; and Yokoto, Takashi, 4,370,742, Cl. 370-58.000.
PACCAR Inc.: *See*—
Fluck, David W., 4,369,996, Cl. 296-97.00K.
Package Machinery Company: *See*—
Groom, James S., 4,370,116, Cl. 425-171.000.
Packman, Albert M., to Dermik Laboratories. Pharmaceutical compositions and method of treatment. 4,370,325, Cl. 424-245.000.
Paco Winders, Inc.: *See*—
Fegley, Richard F.; and Kiss, Steven R., 4,370,140, Cl. 493-289.000.
Pako Corporation: *See*—
Jensen, Gerald A.; and Merry, Ted G., 4,370,184, Cl. 156-157.000.
Palazzetti, Mario; and Salotti, Gianfranco, to Centro Ricerche Fiat S.p.A. Electric power distribution system. 4,370,562, Cl. 307-38.000.
Palmer, John P.; and McCann, Patrick J., to ITW Limited. Cable clips. 4,369,946, Cl. 248-74.00A.
Palz, Helmut, to Didier-Werke AG. Regenerative air preheater with improved insulation between combustion chamber and checker shaft. 4,369,954, Cl. 266-139.000.
Panda, Jajnya D.; and Mahapatra, Santosh K., to Dalmia Institute of Scientific and Industrial Research; and Orissa Cement Limited. Process for the production of magnesium oxide from brine or bittern. 4,370,422, Cl. 501-108.000.
Panseri, Pietro: *See*—
Ancillotti, Francesco; Terzoni, Giuseppe; Micucci, Lidio; Maggioni, Paolo; and Panseri, Pietro, 4,370,506, Cl. 568-785.000.
Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the manufacture of 2-hydroxybenzothiazoles. 4,370,483, Cl. 548-165.000.
Papenhagen, Dieter; and Komoschinski, Norbert, to Daimler-Benz Aktiengesellschaft. Multi-link drive pedal of plastic material. 4,369,670, Cl. 74-513.000.
Papst Motoren GmbH und Co. KG: *See*—
Burgbacher, Martin, 4,370,580, Cl. 310-67.00R.
Papuchon, Michel: *See*—
Puech, Claude; Ardilty, Herve; and Papuchon, Michel, 4,370,612, Cl. 324-117.00R.
Paquette, Elmer G.: *See*—
Fisher, E. Eugene; Estes, R. Ray; Lokken, Orvin D.; and Paquette, Elmer G., 4,370,350, Cl. 426-5.000.
Paradis, Joseph R.; and Kaleskas, Edward W., to Nypro Inc. Control of fluid flow using precisely positioned disc. 4,369,812, Cl. 137-843.000.
Paras, Charles E.: *See*—
Manion, Francis M.; and Paras, Charles E., 4,369,811, Cl. 137-819.000.
Parisi, Sebastiano, to Novum in Elettrodomestica Srl. Machine to wash surfaces. 4,369,544, Cl. 15-320.000.
Park, Ki D. Cupola furnace system. 4,369,955, Cl. 266-139.000.
Park-Ohio Industries, Inc.: *See*—
Risberg, Robert L., 4,370,703, Cl. 363-136.000.
Parker, Richard A. Card dealer wheel assembly with adjustable arm. 4,369,972, Cl. 273-148.00A.
Parkyn, Derek J.: *See*—
Bugg, Richard E. F.; and Parkyn, Derek J., 4,370,747, Cl. 375-62.000.
Parrish, John D., to Reed Rock Bit Company. Large diameter oil well drilling bit. 4,369,849, Cl. 175-340.000.
Parshikov, Viktor I.: *See*—
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.
Passavant-Werke AG & Co. KG: *See*—
Busse, Oswald; and Klesper, Hugo, 4,370,232, Cl. 210-224.000.
Passovoy, Alexander E. Door frame assembly with improved characteristics. 4,369,600, Cl. 49-504.000.
Pasternak, Stephen F., to Peerless of America, Inc. Tube supports. 4,369,833, Cl. 165-67.000.
Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, to Argus Chemical Corporation. Polymerizing unsaturated monomers with gem-diperoxyester catalyst. 4,370,459, Cl. 526-227.000.
Pataki, Karoly: *See*—
Dencs, Bela; Ormos, Zoltan; and Pataki, Karoly, 4,370,198, Cl. 159-48.100.
Patmark Consultants: *See*—
Bollier, J. F., 4,369,717, Cl. 109-45.000.
Patmore, David J.; Ranganathan, Ramaswami; Khulbe, Chandra P.; and Pruden, Barry B., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Catalytic hydrocracking of heavy oils. 4,370,221, Cl. 208-112.000.
Patten, Harold B.; and Patten, Samuel H. Elevator conveyor for tomatoes or the like. 4,369,871, Cl. 198-320.000.
Patten, Samuel H.: *See*—
Patten, Harold B.; and Patten, Samuel H., 4,369,871, Cl. 198-320.000.
Paul, Amy S., to Kendall Company, The. Disposable garment with card loop. 4,369,527, Cl. 2-51.000.
Pautsch, Gunthard: *See*—
Hemfort, Heinrich; Peitzmann, August; Neukotter, Wilhelm; Pautsch, Gunthard; and Guunnewig, Hubert, 4,369,698, Cl. 99-486.000.
Payen, Pierre. Fancy, high-strength fabric. 4,369,816, Cl. 139-426.00R.
Payer, Wolfgang: *See*—
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.
Payne, Elton R.: *See*—
Freeman, Ronnie D.; and Payne, Elton R., 4,369,839, Cl. 166-53.000.
Peak Demand Limiters, Inc.: *See*—
Huffman, Stanley S.; Neel, Alan F.; Swartout, Christopher A.; and Dvorak, Neil E., 4,370,723, Cl. 364-483.000.
Pearson, Glenn A. Fire retardant compositions. 4,370,442, Cl. 524-598.000.
Peerless of America, Inc.: *See*—
Pasternak, Stephen F., 4,369,833, Cl. 165-67.000.
Peil, Archie W.: *See*—
Bishop, Thomas R.; and Peil, Archie W., 4,369,977, Cl. 277-1.000.
Peitzmann, August: *See*—
Hemfort, Heinrich; Peitzmann, August; Neukotter, Wilhelm; Pautsch, Gunthard; and Guunnewig, Hubert, 4,369,698, Cl. 99-486.000.
Penick, Loren C., to Western Electric Company, Inc. Apparatus for preventing electrostatic charge build-up on CRT monitors. 4,370,695, Cl. 361-213.000.
Pennell, Jack: *See*—
Lwoff, Andre; Yerushalmi, Aaron; Cohen, Irun R.; Moshe, Gideon B.; and Pennell, Jack, 4,369,777, Cl. 128-200.140.
Pennell, William E.; and Honigsberg, Charles A., to United States of America, Energy. Sealing arrangement with annular flexible disc. 4,369,893, Cl. 220-378.000.
Perineau, Jean, to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Power steering for motor vehicles. 4,369,694, Cl. 91-368.000.
Perkin-Elmer Corporation, The: *See*—
Whistler, Wayne J.; and Loveland, Robert S., 4,370,615, Cl. 324-457.000.
Perman, Gifford T.; and Poff, David A., to General Electric Company. Apparatus for cutting strip material. 4,369,684, Cl. 83-216.000.
Peroxide Chemie GmbH: *See*—
Appel, Hans; and Brossmann, Gottfried, 4,370,276, Cl. 260-463.000.
Perrin, Marc, to Cycles Peugeot. Device for automatically controlling the closure of the decompression valve of an internal combustion engine. 4,369,741, Cl. 123-182.000.
Perry, J. E. Propelling method and device. 4,369,592, Cl. 42-54.000.
Perry, Leroy A.; and Scott, Charles E., to Emhart Industries, Inc. Appliance control system. 4,370,566, Cl. 307-141.000.
Persiani, Carmine: *See*—
Pink, Francis X.; Persiani, Carmine; and Lublin, Paul, 4,370,751, Cl. 378-47.000.
Peteri, Dezsoe: *See*—
Scherm, Arthur; and Peteri, Dezsoe, 4,370,329, Cl. 424-250.000.
Scherm, Arthur; and Peteri, Dezsoe, 4,370,330, Cl. 424-250.000.
Peters, Robert C.: *See*—
Willemsen, Petrus J. M.; Konijnendijk, Willem L.; and Peters, Robert C., 4,370,595, Cl. 313-486.000.
Petersen-Hoj, Peter, to Tetra Pak Developpement SA. Method for the manufacture of biaxially orientation-stretched plastic film. 4,370,293, Cl. 264-514.000.
Petersen, Wallace C.: *See*—
Levitt, George; and Petersen, Wallace C., 4,370,480, Cl. 544-320.000.
Petit, Jean-Francois: *See*—
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique: Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.
Petit-Martenon, Francoise: *See*—
Greff, Daniel; Petit-Martenon, Francoise; and Toan, Tran, 4,370,315, Cl. 424-94.000.
Pettigrew, Archibald M.: *See*—
Greig, George H.; and Pettigrew, Archibald M., 4,370,683, Cl. 360-73.000.
Peyronel, Jean-Francois: *See*—
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plau, Bernard; and Peyronel, Jean-Francois, 4,370,478, Cl. 542-427.000.
Pezzoli, Silves tro; and Rossi, Giancarlo, to Societa Italiana Resine S.I.R. S.p.A. Concentrated aqueous solution of phenol and formaldehyde stable at low temperature process for preparing same. 4,370,444, Cl. 524-732.000.
Pfaff Industriemaschinen GmbH: *See*—
Bolldorf, Kurt; and Bruckner, Ernst, 4,369,721, Cl. 112-98.000.
Pfeffer, George B., to Datafile Limited. Manual label applying template. 4,369,582, Cl. 33-180.00R.
Pfizer Inc.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,370,328, Cl. 424-250.000.
Pfleiderer, Hans-Joerg: *See*—
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,370,724, Cl. 364-561.000.

Pfohl, Rainer: *See*—
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,370,207, Cl. 204-95.000.
Pharmindustrie: *See*—
Mizoule, Jacques, 4,370,338, Cl. 424-270.000.
Phillips, Charles W. Method of converting a sports car to a reproduction of a vintage motor car. 4,369,559, Cl. 29-401.100.
Phillips, Clarence W.; Eiben, Michael R.; and Morgan, Harvey T., Jr., to Computer Service, Inc. Computer system for generating architectural specifications and project control instructions. 4,370,707, Cl. 364-200.000.
Phillips Petroleum Company: *See*—
Allison, George M., III; and Wilt, Mason S., 4,370,433, Cl. 524-274.000.
Cheng, Paul J., 4,370,309, Cl. 423-461.000.
Clear, Elmer E., 4,369,844, Cl. 166-294.000.
Eastman, Alan D.; and Kolts, John H., 4,370,259, Cl. 252-437.000.
Fenstermaker, Roger W., 4,370,150, Cl. 55-16.000.
Ferguson, Robert C., 4,370,236, Cl. 210-634.000.
Furr, Danny L., 4,369,803, Cl. 137-6.000.
Hybler, Ludmila, 4,370,211, Cl. 204-148.000.
Leland, John E., 4,370,448, Cl. 525-99.000.
Nikkel, Ronnie D., 4,369,555, Cl. 28-221.000.
Salmon, Emigdio J., 4,370,471, Cl. 528-388.000.
Siedenstrang, Roy W.; and Thorsrud, Agmund K., 4,370,189, Cl. 156-272.200.
Tolonen, William J.; and Pitchford, Armin C., 4,370,170, Cl. 106-277.000.
Uraneck, Carl A.; and Clark, Earl, 4,370,252, Cl. 252-311.000.
Vidaurri, Fernando C.; and Anderson, Kenneth L., 4,370,470, Cl. 528-388.000.
Walker, Darrell W., 4,370,310, Cl. 423-600.000.
Willcox, Kenneth W.; and Randall, James C., 4,370,437, Cl. 524-397.000.
Pierre Fabre S.A.: *See*—
Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, 4,370,347, Cl. 424-324.000.
Pignataro, Dominic F.: *See*—
McDonald, Donald C.; Ela, Roger B.; and Pignataro, Dominic F., 4,370,693, Cl. 361-145.000.
PIKAZ, inzenyrsky podnik: *See*—
Skrdlant, Karel; and Milota, Lubor, 4,369,566, Cl. 29-597.000.
Pinch, Harry L.: *See*—
Wang, Chih C.; Pinch, Harry L.; and Bates, Ronald F., 4,370,739, Cl. 369-126.000.
Pink, Francis X.; Persiani, Carmine; and Lublin, Paul, to GTE Laboratories Incorporated. Method of non-destructively measuring the pressure of a gas in a closed vessel. 4,370,751, Cl. 378-47.000.
Pioneer Electronic Corporation: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,370,522, Cl. 179-1.0GD.
Piston Powered Products a division of RW Technologies, Inc.: *See*—
Everts, Robert G., 4,369,742, Cl. 123-193.00P.
Pitchford, Armin C.: *See*—
Tolonen, William J.; and Pitchford, Armin C., 4,370,170, Cl. 106-277.000.
Pitt, Maxwell G.: *See*—
Donaghue, Paul F.; Love, Thomas L.; Mitchell, Kenneth A. W.; and Pitt, Maxwell G., 4,369,689, Cl. 86-20.00C.
Pitts, Leslie: *See*—
Clarke, John B.; and Pitts, Leslie, 4,370,429, Cl. 524-60.000.
Pizzirani, Cesare. Apparatus for encasing excavations. 4,370,079, Cl. 405-272.000.
Plaisance, Thomas H.: *See*—
Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,370,441, Cl. 524-539.000.
Plastic Forming Company, Inc., The: *See*—
Schurman, Peter T., 4,369,575, Cl. 30-151.000.
Plate Bonn Gesellschaft mit beschrankter Haftung: *See*—
Raabe, Fritz; and Schruhl, Robert, 4,370,374, Cl. 428-216.000.
Plau, Bernard: *See*—
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plau, Bernard; and Peyronel, Jean-Francois, 4,370,478, Cl. 542-427.000.
Plessey Overseas Limited: *See*—
Atkins, Sidney H., 4,369,572, Cl. 29-879.000.
Pluck, Christian; and Schuster, Peter, to Schneider GmbH & Co. Method of production of a lightweight building element. 4,370,285, Cl. 264-43.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Stabilization of aqueous silicates using alkali siliconates of silylalkyl phosphonates. 4,370,255, Cl. 252-389.00A.
Plunkett, John P.: *See*—
Kenny, Thomas C.; and Plunkett, John P., 4,370,147, Cl. 44-68.000.
Poff, David A.: *See*—
Perman, Gifford T.; and Poff, David A., 4,369,684, Cl. 83-216.000.
Poinas, Christian: *See*—
Levy, Michel; and Poinas, Christian, 4,370,749, Cl. 375-99.000.
Point 4 Data Corporation: *See*—
Bosch, Eugen I., 4,370,729, Cl. 364-200.000.
Polaroid Corporation: *See*—
Holmes, William A., 4,370,045, Cl. 354-304.000.
Stella, Joseph A., 4,370,035, Cl. 352-78.00R.
Pollak-Banda, Erich; and John, Erich, to Zahnraderfabrik Renk A.G. Axial thrust compensation system. 4,369,668, Cl. 74-414.000.
Polysar Limited: *See*—
Schwarz, Herbert F., 4,370,440, Cl. 524-522.000.
Pont-A-Mousson S.A.: *See*—
Maublanc, Georges, 4,369,545, Cl. 16-64.000.
Posse, Guenther: *See*—
Oberg, Hans-Joachim; Gruensberg, Wolf-Diethard; and Posse, Guenther, 4,369,915, Cl. 494-8.000.
Powell, James R. Method and apparatus for making dental study models. 4,370,135, Cl. 433-213.000.
Power Technologies, Inc.: *See*—
Wilson, Delano D.; and Hedman, Dale E., 4,370,609, Cl. 324-51.000.
Powers, Charles A.; Holman, George B.; and Smith, Robert C., to Standard Oil Company (Indiana). Low density cement slurry and its use. 4,370,166, Cl. 106-97.000.
PPG Industries, Inc.: *See*—
Barch, Herbert W.; Melle, Carl A.; McWilliams, Donald E.; and Hudson, Howard J., 4,370,157, Cl. 65-3.430.
Graham, Roy R., 4,370,169, Cl. 106-267.000.
Graybill, Wilmer B.; and Korach, Malcolm, 4,370,209, Cl. 204-98.000.
Melle, Carl A.; McWilliams, Donald E.; and Das, Balbhadra, 4,370,439, Cl. 524-513.000.
Presley, Arther M.: *See*—
Teed, Richard K.; and Presley, Arther M., 4,369,622, Cl. 57-315.000.
Preuss, Friedrich, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Varnishing assembly in a printing press having self-cleaning feature. 4,369,734, Cl. 118-702.000.
Preuss, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process for the partial reduction of C21-steroid carboxylic acids and their esters to C21-steroid alcohols and new C21-steroid alcohols. 4,370,271, Cl. 260-397.450.
Price, Paul J. Lifting bar assembly. 4,369,968, Cl. 272-123.000.
Procter & Gamble Company, The: *See*—
Abner, Harold D., 4,369,912, Cl. 229-5.600.
Chapin, Carole N.; Kelm, Gary R.; and Shelton, David L., 4,370,319, Cl. 424-184.000.
Professional Positioners, Inc.: *See*—
Huge, Gerald W., 4,370,129, Cl. 433-6.000.
Proge Groupement d'Interet Economique: *See*—
Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,370,394, Cl. 429-199.000.
Propeller Design Limited: *See*—
Church, Leslie G., 4,370,096, Cl. 416-189.000.
Pruden, Barry B.: *See*—
Patmore, David J.; Ranganathan, Ramaswami; Khulbe, Chandra P.; and Pruden, Barry B., 4,370,221, Cl. 208-112.000.
Pruitt, Richard C. Drafting pen accessory. 4,369,580, Cl. 33-42.000.
Pryor, Michael J.; and Tyler, Derek E., to Olin Corporation. Continuous lubrication casting molds. 4,369,832, Cl. 164-472.000.
Puech, Claude; Arditty, Herve; and Papuchon, Michel, to Thomson-CSF. Interferometric optical fiber electric current measuring device. 4,370,612, Cl. 324-117.00R.
Pujado, Peter R., to UOP Inc. Recovery of cumene from a mixture thereof with phenol and water. 4,370,205, Cl. 203-75.000.
Punja, Nazim, to Imperial Chemical Industries PLC. Halogenated esters. 4,370,346, Cl. 424-305.000.
Purcell, John R.; Chen, Wilkie Y.; and Toffolo, Walter E., to General Atomic Company. Methods and apparatus for reducing heat introduced into superconducting systems by electrical leads. 4,369,636, Cl. 62-514.00R.
Quadflieg, Therese: *See*—
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,261, Cl. 252-460.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,492, Cl. 560-245.000.
Quemerais, Philippe: *See*—
Bouvet, Jean M.; and Quemerais, Philippe, 4,369,804, Cl. 137-85.000.
Raabe, Fritz; and Schruhl, Robert, to Plate Bonn Gesellschaft mit beschrankter Haftung. Multilayer plastic film, process for its production and its use. 4,370,374, Cl. 428-216.000.
Rabiner, Lawrence R.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,370,521, Cl. 179-1.0SC.
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, to American Cyanamid Co. Synthesis of tetramisole, levamisole and their derivatives. 4,370,482, Cl. 548-155.000.
Randall, James C.: *See*—
Willcox, Kenneth W.; and Randall, James C., 4,370,437, Cl. 524-397.000.
Ranganathan, Ramaswami: *See*—
Patmore, David J.; Rangasathan, Ramaswami; Khulbe, Chandra P.; and Pruden, Barry B., 4,370,221, Cl. 208-112.000.
Rao, G. R. Mohan: *See*—
McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,370,575, Cl. 307-530.000.
Raper, Larry C.: *See*—
Gerber, Robert L.; and Raper, Larry C., 4,370,631, Cl. 333-106.000.
Rasmussen, Ole S.; and Lund, Peter, to F. L. Smidth & Co. Method and apparatus for grinding granular materials. 4,369,926, Cl. 241-18.000.
Ratto, Howard. Fuel-flow monitor and automatic air-compressor cut-off. 4,369,634, Cl. 62-126.000.

Ratzkin, Barry J.: *See*—
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., 4,370,417, Cl. 435-212.000.

Raubenheimer, Hans-Juergen: *See*—
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.

Ray-O-Vac Corporation: *See*—
Dopp, Robert B., 4,369,568, Cl. 29-623.200.

Raytheon Company: *See*—
Winsor, Donald L., 4,370,596, Cl. 315-3.600.

Razdan, Raj K.: *See*—
Ghosh, Anil C.; and Razdan, Raj K., 4,370,333, Cl. 424-260.000.

Razumney, Gerardo A., to Rexnord, Incorporated. Method of operating an electrochemical gas measuring system. 4,370,206, Cl. 204-1.00T.

RCA Corporation: *See*—
Briggs, George R., 4,370,561, Cl. 307-9.000.
Butterwick, Gilbert N., 4,370,585, Cl. 313-102.000.
Caracappa, Michael G., 4,370,726, Cl. 364-604.000.
Coleman, Clyde F., 4,370,738, Cl. 369-77.000.
Crowley, Albert T., 4,370,653, Cl. 343-6.5LC.
Fitts, Robert W., 4,370,586, Cl. 313-102.000.
Halon, Bernard; and Vossen, John L., Jr., 4,370,195, Cl. 156-643.000.
Hughes, Richard H.; and Marks, Bruce G., 4,370,592, Cl. 313-414.000.
Kaganowicz, Grzegorz, 4,369,604, Cl. 51-281.00R.
Kelly, William R.; and Alvero, Ernesto J., 4,370,036, Cl. 354-1.000.
Kuzenetzoff, Philip, 4,370,594, Cl. 313-458.000.
Malchow, Max E., 4,370,520, Cl. 179-1.0GS.
Ross, Michael D.; and Clemens, Jon K., 4,370,672, Cl. 358-312.000.
Sweigart, Raymond H.; and Doersom, Mary E., 4,370,593, Cl. 313-414.000.
Thompson, Robert P., 4,370,287, Cl. 264-67.000.
Vossen, John L., Jr.; and Halon, Bernard, 4,370,196, Cl. 156-643.000.
Wang, Chih C.; Pinch, Harry L.; and Bates, Ronald F., 4,370,739, Cl. 369-126.000.

Realex Corporation: *See*—
Magers, Wallace F.; and Foster, Donald D., 4,369,899, Cl. 222-153.000.

Redmond, Sanford. Sealed packages for spreadable products. 4,369,885, Cl. 206-484.000.

Reed Rock Bit Company: *See*—
Parrish, John D., 4,369,849, Cl. 175-340.000.

Regie Nationale Des Usines Renault: *See*—
Bouvet, Jean M.; and Quemerais, Philippe, 4,369,804, Cl. 137-85.000.

Rehkopf, Paul G.; and Zdrojkowski, Ronald, to Contemporary Ocu-Flo, Inc. Surgical fluid flow system. 4,369,785, Cl. 128-276.000.

Reible, George A., Jr., to International Business Machines Corporation. Advanced plasma panel technology. 4,370,651, Cl. 340-825.860.

Reiman, Ralph E., to Grinding & Polishing Machinery Corp. Abrasive head. 4,369,606, Cl. 51-334.000.

Reliance Electric Company: *See*—
Zigler, James D., 4,370,139, Cl. 474-45.000.

Rengo Co., Ltd.: *See*—
Tokuno, Masateru, 4,369,905, Cl. 226-17.000.

Rentel, Alfred: *See*—
Ahlers, Egon; and Rentel, Alfred, 4,369,820, Cl. 141-39.000.

Repa Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,369,931, Cl. 242-107.000.
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,369,932, Cl. 242-107.40A.

Republic Steel Corporation: *See*—
Waid, George M.; and Davenport, Anthony T., 4,370,178, Cl. 148-12.00F.

Rettich, Thomas A.; and Woodworth, Raymond D., to Minnesota Automotive, Inc. Electronically actuated brake system. 4,370,714, Cl. 364-426.000.

Retzer, Michael H.: *See*—
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,370,748, Cl. 375-94.000.

Reul, Bernhard: *See*—
Hiller, Dietrich; Klatt, Peter; and Reul, Bernhard, 4,369,783, Cl. 128-260.000.

Reuter, Wolfgang: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,370,327, Cl. 424-246.000.

Rexham Corporation: *See*—
Canfield, Allen B., 4,369,611, Cl. 53-127.000.

Rexnord, Incorporated: *See*—
Razumney, Gerardo A., 4,370,206, Cl. 204-1.00T.

Reynolds, Gibson: *See*—
Doniger, Jerry; Kirchhein, Albert T.; and Reynolds, Gibson, 4,370,706, Cl. 364-184.000.

Rheinmetall GmbH: *See*—
Backstein, Guenter; Unger, Hans W.; Guenther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,369,709, Cl. 102-229.000.

Rhone-Poulenc Industries: *See*—
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,370,426, Cl. 523-310.000.
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plau, Bernard; and Peyronel, Jean-Francois, 4,370,478, Cl. 542-427.000.

Rhone-Poulenc Systemes: *See*—
Ceintrey, Claude; and Detain, Monique, 4,370,397, Cl. 430-10.000.

Ricardo Consulting Engineers Limited: *See*—
Thring, Robert H., 4,369,746, Cl. 123-261.000.

Rice, M. John, Jr.; and Legge, Ronald N., to Motorola, Inc. Process for forming self-supporting semiconductor film. 4,370,288, Cl. 264-81.000.

Rice, Robert C. Combination tool chest dolly and leaved workbench. 4,369,822, Cl. 144-286.00R.

Richard, Louis: *See*—
Blandin, Jean-Claude; and Richard, Louis, 4,370,186, Cl. 156-203.000.

Richardson, Anthony C., to Transcanada Pipelines Ltd. Pipeline crawler. 4,369,713, Cl. 104-138.00G.

Richardson, Douglas A.: *See*—
Richardson, William A.; and Richardson, Douglas A., 4,369,701, Cl. 101-32.000.

Richardson Graphics Company: *See*—
Jones, Thomas H., 4,370,406, Cl. 430-331.000.

Richardson, Harvey J., to Burroughs Corporation. Floppy pack with enhanced orifice means. 4,370,688, Cl. 360-99.000.

Richardson, William A.; and Richardson, Douglas A. Calligraphic apparatus and method. 4,369,701, Cl. 101-32.000.

Ricketts, Thomas E.: *See*—
Kvapil, Rudolph; and Ricketts, Thomas E., 4,370,003, Cl. 299-2.000.

Ricoh Company, Ltd.: *See*—
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Kitamura, Takahiko, 4,369,733, Cl. 118-691.000.
Horike, Masanori; Yoshiba, Yutaka; and Ebi, Yutaka, 4,370,664, Cl. 346-75.000.
Hou, Shou L.; and Tashiro, Isao, 4,370,662, Cl. 346-75.000.
Iwata, Susumu; and Maruta, Keiichi, 4,370,370, Cl. 428-40.000.
Jinnai, Koichiro; and Umezawa, Michio, 4,369,964, Cl. 271-260.000.
Matsushita, Yoh, 4,370,564, Cl. 307-140.000.
Sato, Tsutomu, 4,370,398, Cl. 430-42.000.

Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., to Westinghouse Electric Corp. Plug installation apparatus. 4,369,662, Cl. 73-862.010.

Riedel-De Haen Aktiengesellschaft: *See*—
Hirschberg, Rudolf; and Schonfeld, Bernd, 4,370,148, Cl. 51-293.000.

Riegel Textile Corporation: *See*—
Teed, Richard K.; and Pressley, Arther M., 4,369,622, Cl. 57-315.000.

Rieger, Franz: *See*—
Steinke, Leo; Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,369,748, Cl. 123-425.000.

Riekkinen, Asko S.; and Ronneberg, Allan F., to Oy Nokia AB. Apparatus for forming a long leading end in a wire when winding said wire on a reel. 4,369,928, Cl. 242-25.00A.

Riemscheid, Helmut: *See*—
Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, 4,369,979, Cl. 277-212.0FB.

Rieter Machine Works Ltd.: *See*—
Meile, Hanspeter, 4,369,550, Cl. 19-240.000.

Rietman, David W., to Allis-Chalmers Corporation. Multiple section mast with a pair of lift jacks behind the primary section uprights. 4,369,861, Cl. 187-9.00E.

Rijckaert, Albert M. A., to U.S. Philips Corporation. Phase comparison circuit arrangement. 4,370,619, Cl. 328-133.000.

Risberg, Robert L., to Park-Ohio Industries, Inc. Solid state frequency converter. 4,370,703, Cl. 363-136.000.

Riva, Aldo: *See*—
de Buman, Alain; Riva, Aldo; and Sucker, Heinz, 4,369,784, Cl. 128-271.000.

Rivola, Giovanni: *See*—
Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,370,474, Cl. 536-6.400.

Robbins, Richard F., to Auerbach, Frederick F., a part interest. Arterial arm board. 4,369,774, Cl. 128-133.000.

Robert Bosch GmbH: *See*—
Leiber, Heinz, 4,370,715, Cl. 364-426.000.
Steinke, Leo; Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,369,748, Cl. 123-425.000.

Roberts, Christopher H.: *See*—
Mills, John B.; and Roberts, Christopher H., 4,370,542, Cl. 219-121.0LH.

Roberts, Harold D. One piece permanent support frame for upper dentures. 4,370,134, Cl. 433-173.000.

Roberts, Michael G.; and Tanner, Joseph F., to Owens-Corning Fiberglas Corporation. Asphalt based coatings. 4,370,435, Cl. 524-312.000.

Roberts, Wallace A. Dermatological ionizing vaporizer. 4,369,776, Cl. 128-200.140.

Robertson, Brooks A.: *See*—
Robertson, Donald E.; Robertson, Randall E.; Robertson, Darrin D.; and Robertson, Brooks A., 4,369,547, Cl. 17-21.000.

Robertson, Darrin D.: *See*—
Robertson, Donald E.; Robertson, Randall E.; Robertson, Darrin D.; and Robertson, Brooks A., 4,369,547, Cl. 17-21.000.

Robertson, Donald E.; Robertson, Randall E.; Robertson, Darrin D.; and Robertson, Brooks A. Animal skinning machine. 4,369,547, Cl. 17-21.000.

Robertson, Randall E.: *See—*
Robertson, Donald E.; Robertson, Randall E.; Robertson, Darris D.; and Robertson, Brooks A., 4,369,547, Cl. 17-21.000.
Robins, David S.: *See—*
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,370,748, Cl. 375-94.000.
Robinson, Glenn N.; and Seeney, Charles E., to Angus Chemical Co. Method for dispersing comminuted solids. 4,370,171, Cl. 106-300.000.
Robinson, Thomas C.; and Kitrilakis, Sotiris, to Foxcroft Associates. Hydraulically actuated cardiac prosthesis and method of actuation. 4,369,530, Cl. 3-1.700.
Rockwell International Corporation: *See—*
Donaldson, Jay W., 4,370,515, Cl. 174-35.00R.
Hargrave, Thomas A., 4,370,694, Cl. 361-179.000.
Hornbeck, Sherman J.; and Thornton, Jack C., 4,370,622, Cl. 330-207.00P.
Martin, Thomas F., 4,370,629, Cl. 331-179.000.
Western, Ralph E., 4,370,701, Cl. 363-20.000.
Rodriguez, Luis A. Door locking device for use with interchangeable padlocks. 4,369,993, Cl. 292-148.000.
Roger, Bernard, to U.S. Philips Corporation. Method of making a monolithic complementary Darlington amplifier utilizing diffusion and epitaxial decomposition. 4,370,179, Cl. 148-175.000.
ROHM GmbH Chemische Fabrik: *See—*
Gruber, Wilhelm; and Schroder, Gunter, 4,370,490, Cl. 560-214.000.
Ronneberg, Allan F.: *See—*
Riekkinen, Asko S.; and Ronneberg, Allan F., 4,369,928, Cl. 242-25.00A.
Roscher, Gunter: *See—*
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,261, Cl. 252-460.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, 4,370,492, Cl. 560-245.000.
Rose Verpackungsmaschinen-Fabrik Theegarten GmbH & Co. KG, Firma: *See—*
Schmitz, Heinz, 4,369,875, Cl. 198-456.000.
Rosenberg, Aaron E.: *See—*
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,370,521, Cl. 179-1.0SC.
Ross, Michael D.; and Clemens, Jon K., to RCA Corporation. Color subcarrier regenerator for slow down processor. 4,370,672, Cl. 358-312.000.
Rossi, Giancarlo: *See—*
Pezzoli, Silvestro; and Rossi, Giancarlo, 4,370,444, Cl. 524-732.000.
Rossi, Jean-Paul: *See—*
Clement, Philippe; and Rossi, Jean-Paul, 4,370,420, Cl. 435-256.000.
Rosswurm, Heinz: *See—*
Bieg, Hartmut; Jonas, Hans; Rosswurm, Heinz; Demmer, Wilhelm; and Dobel, Ludwig, 4,369,683, Cl. 83-157.000.
Rosswurm, Mark A.: *See—*
Shuey, Kenneth C.; and Rosswurm, Mark A., 4,370,702, Cl. 363-42.000.
Rothfuss, Robert: *See—*
Herzig, Heinrich G.; and Rothfuss, Robert, 4,370,137, Cl. 434-94.000.
Rothmans of Pall Mall Canada Limited: *See—*
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,369,797, Cl. 131-109.0AB.
Rottloff, Gunter: *See—*
Blank, Heinz U.; Wolters, Erich; Muller, Karl W.; and Rottloff, Gunter, 4,370,499, Cl. 564-200.000.
Roueche, Armand: *See—*
Lienhard, Paul; and Roueche, Armand, 4,370,431, Cl. 524-100.000.
Roullet, Robert: *See—*
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,370,426, Cl. 523-310.000.
Roy, Pierre L.: *See—*
Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; Plas, Bernard; and Peyromel, Jean-Francois, 4,370,478, Cl. 542-427.000.
Roychoudhury, Ranajit: *See—*
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., 4,370,417, Cl. 435-212.000.
Rozeboom, Antonie G. Self-loading feed mixer and transport apparatus with improved grinding and loading mechanism. 4,369,927, Cl. 241-73.000.
Rubricius, Jeannette L.: *See—*
LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeannette L., 4,369,789, Cl. 604-96.000.
Rudolf Sacher Gesellschaft m.b.H.: *See—*
Stengl, Gerhard; and Loschner, Hans, 4,370,556, Cl. 250-503.100.
Ruff, Gunter W.; and Scheffler, Hartmut, to Licentia Patent-Verwaltungs-GmbH. Arrangement for feeding a subscriber device. 4,370,527, Cl. 179-70.000.
Ruffer, Joachim: *See—*
Matthaus, Gunther; and Ruffer, Joachim, 4,370,514, Cl. 174-31.00R.
Ruhrchemie AG: *See—*
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.
Rushing, Allen J.: *See—*
Jackson, David R.; and Rushing, Allen J., 4,369,732, Cl. 118-681.000.
Russell, Benjamin; and Scott, Jerry W., to Econ Company. Apparatus for cleaning filter bags. 4,370,153, Cl. 55-304.000.
Rys-Sikora, John, to Bata Limited. Fast-curing foamable composition based on ethylene terpolymers. 4,370,423, Cl. 521-84.000.
Ryss, Alexandr S., deceased: *See—*
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.
Ryss, Maria I., legal representative: *See—*
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.
Ryu, Yumi P.; Anglin, James R.; and Singerman, Gary M., to Gulf Research & Development Company. Grease compositions containing quaternary ammonium thiomolybdates. 4,370,245, Cl. 252-46.400.
S&C Electric Company: *See—*
Tobin, Thomas J., 4,370,531, Cl. 200-151.000.
S.K.Y. Polymers: *See—*
Stoy, Vladimir A., 4,370,451, Cl. 525-294.000.
Sabet, Huschang; and Eckhardt, Dietrich, to Sabet, Huschang. Rotary piston-internal combustion engine having a central axis. 4,370,109, Cl. 418-34.000.
Sachse, Burkhard: *See—*
Gildemeister, Horst; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Sachse, Burkhard, 4,370,320, Cl. 424-200.000.
Safetran Systems Corporation: *See—*
Wilson, H. James, 4,369,942, Cl. 246-34.0CT.
Sagami Chemical Research Center: *See—*
Ojima, Iwao; and Fuchikami, Takamasa, 4,370,504, Cl. 568-454.000.
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, to Toyama Chemical Company, Ltd. Pharmaceutical composition comprising extract from poison pouch contents of bee useful for treating decreased immunity. 4,370,316, Cl. 424-98.000.
Saito, Masaaki, to Nissan Motor Co., Ltd. Air control device. 4,369,755, Cl. 123-588.000.
Saito, Shigeru: *See—*
Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, 4,370,279, Cl. 260-465.300.
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, to Yoshino Kogyosho Co., Ltd. Manual accumulator type atomizer. 4,369,900, Cl. 222-321.000.
Saito, Tamio, to Tokyo Shibaura Denki Kabushiki Kaisha. Printed wiring board for recording or displaying information. 4,370,699, Cl. 361-406.000.
Sakaguchi, Harunori: *See—*
Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shiina, Toshio, 4,370,517, Cl. 174-74.00A.
Sakai, Eiichi, to Sharp Kabushiki Kaisha. Blocking condition detection device in a medical fluid injection system. 4,369,780, Cl. 128-214.00E.
Sakai, Hiroshi: *See—*
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Sakai, Yasunosuke: *See—*
Ogura, Toshimasa; and Sakai, Yasunosuke, 4,370,389, Cl. 428-511.000.
Sakon, Tohatirou: *See—*
Arimatsu, Toshio; and Sakon, Tohatirou, 4,370,283, Cl. 264-37.000.
Sakota, Yukio: *See—*
Katagiri, Mikio; Sakota, Yukio; Hiroshige, Kunie; and Adachi, Yukio, 4,370,187, Cl. 156-244.230.
Saldi, Giorgio: *See—*
Sannipoli, Anna M.; Nibi, Lordana; and Saldi, Giorgio, 4,369,869, Cl. 192-131.00R.
Salensky, George A., to Union Carbide Corporation. Modified zinc-rich coatings. 4,370,382, Cl. 428-418.000.
Saller, Helmut: *See—*
Lange, Gerhard; and Saller, Helmut, 4,370,023, Cl. 350-96.230.
Salmi, Pekka; and Helin, Aimo, to Oy Tampella Ab. Control system for a rock drill. 4,369,848, Cl. 173-8.000.
Salmi, Robert W.: *See—*
Bingel, John P.; and Salmi, Robert W., 4,370,225, Cl. 209-40.000.
Salminen, Reijo K. Hockey stick and method of manufacturing the same. 4,369,970, Cl. 273-67.00A.
Salmon, Emigdio J., to Phillips Petroleum Company. Heat curing arylene sulfide polymer. 4,370,471, Cl. 528-388.000.
Salotti, Gianfranco: *See—*
Palazzetti, Mario; and Salotti, Gianfranco, 4,370,562, Cl. 307-38.000.
Salvatore, Osvaldo: *See—*
Venturello, Giorgio; and Salvatore, Osvaldo, 4,369,663, Cl. 73-862.040.
Salys, Casimer K.: *See—*
Tusk, Harry L.; Courtright, John F.; and Salys, Casimer K., 4,370,024, Cl. 350-162.120.

Samejima, Yasushi: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, 4,370,208, Cl. 204-98.000.

Sanders, Cledith A.; Sanders, Margaret M.; and Sanders, Cledith A., II. Hydrogen-oxygen generator. 4,369,737, Cl. 123-3.000.

Sanders, Cledith A., II: *See*—
Sanders, Cledith A.; Sanders, Margaret M.; and Sanders, Cledith A., II, 4,369,737, Cl. 123-3.000.

Sanders, John H., to Badische Corporation. Blending method using a roving disintegrator-dispenser. 4,369,549, Cl. 19-145.700.

Sanders, Margaret M.: *See*—
Sanders, Cledith A.; Sanders, Margaret M.; and Sanders, Cledith A., II, 4,369,737, Cl. 123-3.000.

Sandoz Ltd.: *See*—
de Buman, Alain; Riva, Aldo; and Sucker, Heinz, 4,369,784, Cl. 128-271.000.

Sankyo Company, Limited: *See*—
Arai, Mamoru; Haneishi, Tatsuo; Nakajima, Mutsuo; Torikata, Akio; and Enokita, Ryuzo, 4,370,266, Cl. 260-112.50R.

Sannipoli, Anna M.; Nibi, Lordana; and Saldi, Giorgio, to Sicurpress Antinfortunistica & C. Safety device for mechanical or hydraulic presses. 4,369,869, Cl. 192-131.00R.

Sapkus, Jurgis, to Mattel, Inc. Hair braiding apparatus. 4,369,690, Cl. 87-33.000.

Sarai, Hiroshi; Hamada, Eiichi; and Ueda, Norihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for preventing tubular bushing assembly from slipping out. 4,370,005, Cl. 384-154.000.

Sasaki, Katsushi: *See*—
Suzuoka, Akihiro; Okuhira, Toshifumi; Matsumura, Eiji; and Sasaki, Katsushi, 4,370,302, Cl. 422-137.000.

Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. System for entering temperature control data and displaying it with the temperature scale. 4,370,731, Cl. 364-900.000.

Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, to Nissan Motor Company, Limited; and Jidosha Denki Kogyo Kabushiki Kaisha. Fluid pumping device. 4,370,102, Cl. 417-296.000.

Sasaki, Reiichi: *See*—
Tomimoto, Tetsuo; Nagaoka, Yoshitomi; Sasaki, Reiichi; and Oyama, Hiroshi, 4,370,673, Cl. 358-21.00R.

Sasaki, Setsuo, to TDK Electronics Co., Ltd. Through type high-withstand-voltage ceramic. 4,370,698, Cl. 361-330.000.

Sasaki, Takao: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,370,722, Cl. 364-474.000.

Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, to Nitto Chemical Industry Co., Ltd. Process for production of acrylonitrile. 4,370,279, Cl. 260-465.300.

Sato, Hiroshi: *See*—
Suzuki, Kenpei; Koya, Shinichi; and Sato, Hiroshi, 4,370,011, Cl. 339-74.00R.

Sato, Kanemasa: *See*—
Ueno, Sadayasu; Sato, Kanemasa; Oyama, Yoshishige; Nishimura, Yutaka; and Miya, Kazuhiko, 4,369,656, Cl. 73-204.000.

Sato, Masamichi; Matsumoto, Kenji; and Seki, Kazuhisa, to Fuji Photo Film Co., Ltd.; and Fuji Photo Optical Co., Ltd. Multicolor optical filter with a united interference filter and dye filter and process for making the same. 4,370,025, Cl. 350-166.000.

Sato, Masamichi; Matsumoto, Kenji; and Naito, Shunichi, to Fuji Photo Film Co., Ltd.; and Fuji Photo Optical Co., Ltd. Process for producing color filter plates. 4,370,396, Cl. 430-7.000.

Sato, Masatoshi; and Takahashi, Yosuke, to Nippon Kogaku K.K. Anti-reflection film with an ion-penetration prevention layer. 4,370,027, Cl. 350-164.000.

Sato, Tsutomu, to Ricoh Company, Ltd. Electrostatic copying process. 4,370,398, Cl. 430-42.000.

Sato, Yoshinari, to Fujisawa Pharmaceutical Co., Ltd. 1,4-Dihydropyridine derivatives and methods of using same. 4,370,334, Cl. 424-266.000.

Satoh, Susumu: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,370,340, Cl. 424-274.000.

Satoh, Yoshio, to Hitachi, Ltd. Color picture tube shadow mask. 4,370,591, Cl. 313-402.000.

Satren, Ernest A.: *See*—
Axmark, Roger E.; and Satren, Ernest A., 4,370,557, Cl. 250-554.000.

Savinell, Robert F.; and Liu, Chung-Chiun, to University of Akron, The. Chrome-halogen energy storage device and system. 4,370,392, Cl. 429-15.000.

Savov, Ivan S.: *See*—
Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., 4,369,919, Cl. 239-79.000.

Sawada, Yasuo: *See*—
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Kitamura, Takahiko, 4,369,733, Cl. 118-691.000.

Saylor, Charles J.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., 4,370,008, Cl. 339-4.000.

Scales, John M., to Nicolon Corporation. Revetment grids and mats. 4,370,075, Cl. 405-20.000.

Scearce, Forest A., to NL Industries, Inc. Method of determining the concentration of solid lubricants in drilling fluids. 4,369,655, Cl. 73-153.000.

Schaefer, Eberhard: *See*—
Bott, Kaspar; Kaibel, Gerd; Hoffmann, Herwig; Irnich, Rudolf; and Schaefer, Eberhard, 4,370,491, Cl. 560-234.000.

Schafer, Hans: *See*—
Herbrechtsmeier, Peter; Schafer, Hans; and Steiner, Rudolf, 4,370,151, Cl. 55-38.000.

Schafer, Robert J., to Ashland Oil, Inc. Process for no-bake foundry application utilizing polyurethanes based on amine polyols. 4,370,463, Cl. 528-78.000.

Schapsmeier, Wilhelm: *See*—
Heuer, Helmut; Schapsmeier, Wilhelm; and Fohlmeister, Hans D., 4,369,877, Cl. 198-509.000.

Schaum-Chemie W. Bauer GmbH & Co KG: *See*—
Baumann, Heinz, 4,370,424, Cl. 521-121.000.

Scheffler, Hartmut: *See*—
Ruff, Gunter W.; and Scheffler, Hartmut, 4,370,527, Cl. 179-70.000.

Scherm, Arthur; and Peteri, Dezsoe, to Merz & Company. Piperazine derivatives as circulation-enhancing substances. 4,370,329, Cl. 424-250.000.

Scherm, Arthur; and Peteri, Dezsoe, to Merz & Company. Method of enhancing circulation with piperazines. 4,370,330, Cl. 424-250.000.

Schink, Karl: *See*—
Muhr, Richard; and Schink, Karl, 4,369,907, Cl. 227-54.000.

Schluger, Allen, to Modular Magazine Sampling Systems, Inc. Container for product samples. 4,369,882, Cl. 206-232.000.

Schmenk, Myron J.: *See*—
Berenberg, John A.; Haggerty, William A.; Kegg, Richard L.; Schmenk, Myron J.; and Taylor, Ralph C., Jr., 4,370,721, Cl. 364-474.000.

Schmid, Johannes: *See*—
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, 4,369,932, Cl. 242-107.40A.

Schmid, Karl; and Jakobi, Wilhelm, to Krupp-Koppers GmbH. Cooling device for coke dry cooling. 4,370,203, Cl. 202-228.000.

Schmidt, Gunther, to Messerschmitt-Bolkow-Blohm GmbH. Arrangement to cool the thrust nozzle for a rocket engine. 4,369,920, Cl. 239-127.300.

Schmidt, Sylvia; Eckert, Hansdieter; Holzinger, Wolfgang; and Holle, Dietrich, to Neue Bruderhaus Maschinenfabrik GmbH; and Andreas Kufferath KG, a part interest. Method of influencing a pre-drained fibrous web on a screen. 4,370,200, Cl. 162-210.000.

Schmitt, Kirk D., to Mobil Oil Corporation. Infrared absorption determination of sulfonate surfactants utilizing deuterated sulfonates. 4,370,146, Cl. 436-120.000.

Schmitz, Heinz, to Rose Verpackungsmaschinen-Fabrik Theegarten GmbH & Co. KG, Firma. Apparatus for isolation and supply of objects, in particular sweets, to a packing machine. 4,369,875, Cl. 198-456.000.

Schneider GmbH & Co.: *See*—
Pluck, Christian; and Schuster, Peter, 4,370,285, Cl. 264-43.000.

Schneider, Rolf: *See*—
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.

Schnell, Carl T. Central heating system. 4,369,917, Cl. 237-12.100.

Schneller, Peter: *See*—
Falbe, Jurgen; Schneller, Peter; Payer, Wolfgang; Forster, Ingrid; Cornils, Boy; Birnkraut, Hans-Walter; Lutze, Siegfried; and Otterbein, Karl, 4,370,458, Cl. 526-138.000.

Schofield, John, to U.S. Philips Corporation. Acoustic wave bandpass electrical filters. 4,370,633, Cl. 333-195.000.

Scholl, Walter, to Bayer Aktiengesellschaft. Reactive dyestuffs. 4,370,268, Cl. 260-146.00T.

Schonfeld, Bernd: *See*—
Hirschberg, Rudolf; and Schonfeld, Bernd, 4,370,148, Cl. 51-293.000.

Schoofs, Franciscus A. C. M.; Nijman, Aloysius J.; and van Dongen, Frederik, to U.S. Philips Corporation. Arrangement for applying a ringing voltage to a subscriber's line. 4,370,526, Cl. 179-51.0AA.

Schrenk, W. Jurgen: *See*—
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; Ratzkin, Barry J.; Schrenk, W. Jurgen; and Chen, Michael C., 4,370,417, Cl. 435-212.000.

Schroder, Gunter: *See*—
Gruber, Wilhelm; and Schroder, Gunter, 4,370,490, Cl. 560-214.000.

Schruhl, Robert: *See*—
Raabe, Fritz; and Schruhl, Robert, 4,370,374, Cl. 428-216.000.

Schuck, Helmut: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,369,706, Cl. 101-365.000.

Schuh, Eduard: *See*—
Kelch, Heinz; and Schuh, Eduard, 4,369,704, Cl. 101-110.000.

Schulke, Karl A., to Heraeus Quarzschmelze GmbH. Heat-treating method for semiconductor components. 4,370,158, Cl. 65-32.000.

Schulz, Johann G.: *See*—
Selwitz, Charles M.; and Schulz, Johann G., 4,370,253, Cl. 252-312.000.

Schulz, Peter, to Dr. C. Otto & Comp. G.m.b.H. Coating compound for silica bricks. 4,370,363, Cl. 427-230.000.

Schulze, Eckehart, to Hartmann & Lammle GmbH & Co. KG. Electrohydraulic servomechanism. 4,369,693, Cl. 91-35.000.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Tote device. 4,369,575, Cl. 30-151.000.
Schuster, Peter: *See*—
Pluck, Christian; and Schuster, Peter, 4,370,285, Cl. 264-43.000.
Schwaebel, Rudolf: *See*—
Ambrosch, Friedrich; and Schwaebel, Rudolf, 4,370,094, Cl. 415-172.00A.
Schwaiger, Gunther; and Hoyer, Ernst, to Hoechst Aktiengesellschaft. Copper formazan compounds, processes for their preparation and their use as dyestuffs. 4,370,145, Cl. 8-549.000.
Schwartz, Paul M.: *See*—
Chu, James C.; Crane, Patrick E.; D'Agostino, Jack V.; and Schwartz, Paul M., 4,370,659, Cl. 343-772.000.
Schwarz, Herbert F., to Polysar Limited. Compositions comprising chlorosulphonated polyethylene, carboxylated butadiene-acrylonitrile and magnesium oxide useful for liners or membranes. 4,370,440, Cl. 524-522.000.
Schweitzer, Francis E., to Du Pont de Nemours, E. I., and Company. Alkylated isoadipoguanamine-formaldehyde crosslinking resin and improved coating compositions produced therefrom. 4,370,427, Cl. 523-400.000.
Scott, Charles E.: *See*—
Perry, Leroy A.; and Scott, Charles E., 4,370,566, Cl. 307-141.000.
Scott & Fetzer Company, The: *See*—
Burgoon, Jack L.; and Karpanty, David J., 4,369,540, Cl. 15-49.00R.
Scott, Howard L.: *See*—
McClain, James E.; Dickson, William D.; and Scott, Howard L., 4,370,098, Cl. 417-18.000.
Scott, Jerry W.: *See*—
Russell, Benjamin; and Scott, Jerry W., 4,370,153, Cl. 55-304.000.
Scott, Leonard F.: *See*—
McCloskey, Chester M.; Fischer, James R.; and Scott, Leonard F., 4,370,485, Cl. 548-404.000.
Scott, Malcolm K., to McNeilab, Inc. Antisecretory 4-diphenylmethyl-1-[(oxoalkyl)imino]methyl-piperidines and their derivatives. 4,370,335, Cl. 424-267.000.
Scranton, Robert J.; and Meckstroth, James R., to Mead Corporation, The. Paper transport for a printer test unit. 4,370,665, Cl. 346-75.000.
Sealed Motor Construction Company, Limited: *See*—
Addicott, Roy W.; and Capaldi, Bernard, 4,370,582, Cl. 310-211.000.
Searson, D. James: *See*—
Spangenberg, Stanley F.; Finley, Arlington L.; and Searson, D. James, 4,370,216, Cl. 204-243.00R.
Sederma: *See*—
Greff, Daniel; Petit-Martenon, Francoise; and Toan, Tran, 4,370,315, Cl. 424-94.000.
Seeney, Charles E.: *See*—
Robinson, Glenn N.; and Seeney, Charles E., 4,370,171, Cl. 106-300.000.
Seidl, Jiri, to Bayerische Motoren Werke A.G. Valve-actuating lever. 4,369,740, Cl. 123-90.450.
Seifert, Helmut; Honl, Wolf-Dieter; Schmid, Johannes; and Frei, Bernhard, to Repa Feinstanzwerk GmbH. Automatic wind-up roller for a safety belt. 4,369,932, Cl. 242-107.40A.
Seikosha Co., Ltd.: *See*—
Ikeno, Hitoshi; Konno, Tetsuro; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,370,584, Cl. 310-365.000.
Seitz-Werke GmbH: *See*—
Ahlers, Egon; and Rentel, Alfred, 4,369,820, Cl. 141-39.000.
Seki, Kazuhisa: *See*—
Sato, Masamichi; Matsumoto, Kenji; and Seki, Kazuhisa, 4,370,025, Cl. 350-166.000.
Seki, Masayuki, to Nissin Kogyo Kabushiki Kaisha. Disc brake assembly for vehicle use. 4,369,862, Cl. 188-73.450.
Sekmakas, Kazys: *See*—
Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,370,441, Cl. 524-539.000.
Selwitz, Charles M.; and Schulz, Johann G., to Gulf Research & Development Company. Alkenylsuccinic acid emulsions and their preparation. 4,370,253, Cl. 252-312.000.
Semi, Hidetoshi: *See*—
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, 4,370,731, Cl. 364-900.000.
Semperit AG: *See*—
Haberl, Rainer; and Kastner, Josef, 4,370,697, Cl. 361-283.000.
Sensors, Inc.: *See*—
Waycaster, Roy A.; Baker, William T.; and Bidle, Jerry D., 4,370,553, Cl. 250-343.000.
Serletic, Bernard T.: *See*—
Giggey, Robert W.; Serletic, Bernard T.; and Ashley, Charles R., 4,369,880, Cl. 206-63.300.
Servais, Stephen B.: *See*—
Lentz, Richard P.; Lasky, Thomas J.; and Servais, Stephen B., 4,369,660, Cl. 73-753.000.
Service Distributors, Inc.: *See*—
Sidline, George B., 4,370,550, Cl. 235-449.000.
SGB Group Limited: *See*—
Smits, Marinus A. L., 4,369,859, Cl. 182-179.000.
Shafer, Richard H.: *See*—
Dill, Ken A.; Zimm, Bruno H.; and Shafer, Richard H., 4,370,242, Cl. 210-787.000.
Shah, Kishore R., to Kendall Company, The. Pressure-sensitive adhesive. 4,370,380, Cl. 428-355.000.
Sharp Kabushiki Kaisha: *See*—
Sakai, Eiichi, 4,369,780, Cl. 128-214.00E.
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., to Massachusetts Institute of Technology. Orientation of ordered liquids and their use in devices. 4,370,194, Cl. 156-643.000.
Shaw, Graham C.: *See*—
Lundstrom, Norman H.; and Shaw, Graham C., 4,370,181, Cl. 149-2.000.
Shea, Robert H. Rotary pump or motor with drive rollers and free-floating rollers. 4,370,111, Cl. 418-212.000.
Sheldon, Robert W.; and Mullin, Richard W. Prefabricated building system. 4,369,609, Cl. 52-478.000.
Shelton, David L.: *See*—
Chapin, Carole N.; Kelm, Gary R.; and Shelton, David L., 4,370,319, Cl. 424-184.000.
Shepard, James N., to United States Steel Corporation. Dumping apparatus for particulate-bearing container. 4,370,087, Cl. 414-421.000.
Sherwood Medical Industries Inc.: *See*—
Gilson, Richard W.; and Windischman, Edward F., 4,369,781, Cl. 128-214.00R.
Shia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Carignani, Giancarlo; and Cipriani, Aldo, 4,370,425, Cl. 521-138.000.
Shibata, Junichi: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,370,522, Cl. 179-1.0GD.
Shibuya, Kunihiro; Uchida, Koachi; and Hashimoto, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic copying apparatus. 4,370,048, Cl. 355-3.0TR.
Shigemori, Tesshi; Nozawa, Yoshinao; Kojima, Teruhisa; and Kitajima, Satoshi, to New Cosmos Electric Company Limited. Gas leakage detector. 4,369,647, Cl. 73-27.00R.
Shigenobu, Michio; and Ohkubo, Masaharu, to Canon Kabushiki Kaisha. Image recording apparatus. 4,369,729, Cl. 118-60.000.
Shigeyasu, Moseo; and Kuki, Michio, to Matsuyama Petrochemicals Inc. Process for continuous production of high purity terephthalic acid. 4,370,496, Cl. 562-487.000.
Shiina, Toshio: *See*—
Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shiina, Toshio, 4,370,517, Cl. 174-74.00A.
Shimajiri, Yoshibumi: *See*—
Asanuma, Yoshihiko; and Shimajiri, Yoshibumi, 4,369,838, Cl. 165-185.000.
Shimakata, Masashi: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,370,522, Cl. 179-1.0GD.
Shimano Industrial Company Limited: *See*—
Noda, Hideo, 4,369,930, Cl. 242-84.10J.
Noda, Hideo, 4,369,936, Cl. 242-220.000.
Shimazaki, Hiroshi: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; and Shimazaki, Hiroshi, 4,370,290, Cl. 264-184.000.
Shimizu, Toyozi: *See*—
Harada, Taira; Shimizu, Toyozi; and Nagaoka, Takenori, 4,370,502, Cl. 564-411.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, 4,370,365, Cl. 427-387.000.
Shinoda, Tsutae; Yoshikawa, Kazuo; and Miyashita, Yoshinori, to Fujitsu Limited. Self shift type gas discharge panel. 4,370,599, Cl. 315-217.000.
Shinozaki, Fumiaki: *See*—
Tachikawa, Hiromichi; Takahashi, Yohonosuke; Ishii, Kazuo; Ikeda, Tomoaki; and Shinozaki, Fumiaki, 4,370,404, Cl. 430-302.000.
Shinozaki, Nobuya, to Kato Hatsujo Kaisha, Ltd. Structure of a breather pipe for gasoline tanks. 4,369,891, Cl. 220-85.0VR.
Shinryo Air Conditioning Co., Ltd.: *See*—
Suzuki, Akira; and Shioya, Yasumi, 4,370,235, Cl. 210-620.000.
Shionogi & Co., Ltd.: *See*—
Igarashi, Kikuo; Homma, Tsunetoshi; and Sugawara, Tamio, 4,370,475, Cl. 536-16.800.
Mitsugi, Takashi; Muneyuki, Ryonosuke; Wakisaka, Yoshiharu; Koizumi, Kenzo; and Kondo, Eiji, 4,370,414, Cl. 435-44.000.
Shioya, Yasumi: *See*—
Suzuki, Akira; and Shioya, Yasumi, 4,370,235, Cl. 210-620.000.
Shirai, Hisanari: *See*—
Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shiina, Toshio, 4,370,517, Cl. 174-74.00A.
Shirai, Hisao: *See*—
Iwata, Yasuo; and Shirai, Hisao, 4,369,558, Cl. 29-148.40R.
Shiraishi, Fumitake; Fujioka, Masahiko; and Fujiki, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic disk apparatus. 4,370,687, Cl. 360-98.000.
Shirasaki, Takayuki, to Canon Kabushiki Kaisha. Optical scanning device with temperature control means. 4,370,019, Cl. 350-6.600.
Shishido, Yoshio, to Olympus Optical Co., Ltd. Endoscope system. 4,369,767, Cl. 128-6.000.

Showa, Aluminum Kabushiki Kaisha: *See—*
Asanuma, Yoshihiko; and Shimajiri, Yoshihumi, 4,369,838, Cl. 165-185.000.

Shriver, David A., to Ortho Pharmaceutical Corporation. Method of inducing cytoprotection. 4,370,348, Cl. 424-331.000.

Shuey, Kenneth C.; and Rosswurm, Mark A., to Westinghouse Electric Corp. Microprocessor control of inverter power transistors with DC content correction. 4,370,702, Cl. 363-42.000.

Shumaker, John F.; and Maurer, Herman J., to J. I. Case Company. Boom lock. 4,370,090, Cl. 414-694.000.

Sibit, S.p.A.: *See—*
Visca, Mario, 4,370,263, Cl. 252-472.000.

Sicurpress Antinfortunistica & C.: *See—*
Sannipoli, Anna M.; Nibi, Lordana; and Saldi, Giorgio, 4,369,869, Cl. 192-131.00R.

Sidline, George B., to Service Distributors, Inc Dual read-record head for magnetic card machine actuator. 4,370,550, Cl. 235-449.000.

Siedenstrang, Roy W.; and Thorsrud, Agmund K., to Phillips Petroleum Company. Modifying thermoplastic materials and products thereof. 4,370,189, Cl. 156-272.200.

Siemens Aktiengesellschaft: *See—*
Bernhardt, Joerg, 4,370,028, Cl. 350-341.000.
Haass, Adolf, 4,370,741, Cl. 370-24.000.
Herbst, Heiner; Pfleiderer, Hans-Joerg; and Grassl, Hans-Peter, 4,370,724, Cl. 364-561.000.
Lange, Gerhard; and Saller, Helmut, 4,370,023, Cl. 350-96.230.
Matthaus, Gunther; and Ruffer, Joachim, 4,370,514, Cl. 174-31.00R.
Wohlgemuth, Juergen, 4,370,132, Cl. 433-128.000.

Siemens-Allis, Inc.: *See—*
Carroll, John T.; and Yamat, Miguel B., 4,370,635, Cl. 335-20.000.

Siemens Corporation: *See—*
Wagner, Theodore; Vyas, Ramesh M.; and Liang, Samuel, 4,370,648, Cl. 340-825.200.

Siemionko, Roger K., to Du Pont de Nemours, E. I., and Company. Optically anisotropic melt forming polyesters. 4,370,466, Cl. 528-190.000.

Siffroi, Lucien, to La Telemecanique Electrique. Magnetic actuator. 4,370,637, Cl. 335-174.000.

Sigri Elektrographit GmbH: *See—*
Bieg, Hartmut; Jonas, Hans; Rosswurm, Heinz; Demmer, Wilhelm; and Dobel, Ludwig, 4,369,683, Cl. 83-157.000.

Silberman, Ira J.; and James, Calvin E., Sr., to Diversified Products Corporation. Folding exercising apparatus. 4,369,966, Cl. 272-62.000.

Silhouette, Jean-Max M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Device for detecting differences in the speeds of rotation of two shafts. 4,369,658, Cl. 73-507.000.

Simon, David J.: *See—*
Costello, Edward C.; and Simon, David J., 4,370,642, Cl. 340-347.05SY.

Sinay, Pierre: *See—*
Adam, Arlette; Audibert, Francoise; Chedid, Louis; Choay, Jean; Ciorbaru, Rita; Ellouz, Fabrielle; Juy, Dominique; Lefrancier, Pierre; Merser, Claude; Petit, Jean-Francois; Sinay, Pierre; and Lederer, Edgar, 4,370,265, Cl. 260-112.50R.

Singbartl, Gunther: *See—*
Klatt, Alfred; and Singbartl, Gunther, 4,369,696, Cl. 91-465.000.

Singer Company, The: *See—*
Costello, Edward C.; and Simon, David J., 4,370,642, Cl. 340-347.05SY.
Ljung, Bo H. G., 4,370,583, Cl. 310-331.000.

Singerman, Gary M.: *See—*
Ryu, Yumi P.; Anglin, James R.; and Singerman, Gary M., 4,370,245, Cl. 252-46.400.

Singh, Balwant: *See—*
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,370,482, Cl. 548-155.000.

SISA, Incorporated: *See—*
Ghosh, Anil C.; and Razdan, Raj K., 4,370,333, Cl. 424-260.000.

Skelly, James K.; Evans, David G.; and Becker, Carl, to Ciba-Geigy Corporation. Two-phase organic solvent-water dyeing process for polyester fibers. 4,370,144, Cl. 8-501.000.

Skoda, Stanislav: *See—*
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Esner, Stanislav; Skoda, Stanislav; and Janousek, Jan, 4,369,620, Cl. 57-263.000.

Skrdlant, Karel; and Milota, Lubor, to PIKAZ, inzenyrsky podnik. Process of producing front commutators for the rotors of direct current machines. 4,369,566, Cl. 29-597.000.

Sleeper, H. Prescott, Jr. Compound coaxial windmill. 4,370,095, Cl. 416-175.000.

Small, Edward A.; Edwards, Richard H.; Eufusia, Eugene A.; Clary, Robert M.; and Bergfelt, Nils H., to Optical Coating Laboratory, Inc. Multi-layer coating apparatus, system and method. 4,369,876, Cl. 198-460.000.

Smedal, Arne. Apparatus for transfer of persons and goods between structures offshore. 4,369,538, Cl. 14-69.500.

Smiesko, Frank A.: *See—*
Beiswenger, John L.; Moon, Howard R.; Smiesko, Frank A.; and Chaphalkar, Dhananjay, 4,369,921, Cl. 239-317.000.

Smith, Franklin N., Jr.: *See—*
Bird, Thomas O.; White, Jack; and Bird, Carl H., 4,370,249, Cl. 252-62.000.

Smith, Henry I.: *See—*
Shaver, David C.; Smith, Henry I.; and Flanders, Dale C., 4,370,194, Cl. 156-643.000.

Smith, James E., to Control Data Corporation. Branch predictor using random access memory. 4,370,711, Cl. 364-200.000.

Smith, John Conventry, Jr.: *See—*
Williamson, David T. N., 4,369,563, Cl. 29-568.000.

Smith, Robert A.: *See—*
Sprangle, Phillip A.; Smith, Robert A.; and Chu, Kwo R., 4,370,621, Cl. 330-4.000.

Smith, Robert C.: *See—*
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,370,166, Cl. 106-97.000.

Smith, Stuart B., to Thermoset AG. Foaming apparatus. 4,370,117, Cl. 425-224.000.

Smits, Marinus A. L., to SGB Group Limited. Scaffolding system. 4,369,859, Cl. 182-179.000.

Snaidr, Stanislav M.: *See—*
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,369,797, Cl. 131-109.0AB.

Snap-On Tools Corporation: *See—*
Lentz, Richard P.; Lasky, Thomas J.; and Servais, Stephen B., 4,369,660, Cl. 73-753.000.

Snyder, David A. Multiple stage compressor with flash gas injection assembly. 4,369,633, Cl. 62-117.000.

Snyder, John R.: *See—*
Cianciolo, Cosmo J.; Snyder, John R.; and King, Roderick V., 4,369,643, Cl. 72-75.000.

Societa Italiana Resine S.I.R. S.p.A.: *See—*
Pezzoli, Silvestro; and Rossi, Giancarlo, 4,370,444, Cl. 524-732.000.

Societe Anonyme Automobiles Citroen: *See—*
Perineau, Jean, 4,369,694, Cl. 91-368.000.

Societe Anonyme des Usines Chausson: *See—*
Moranne, Jean-Pierre, 4,369,837, Cl. 165-175.000.

Societe CGR-MeV: *See—*
Brethon, Jean-Pierre; Guiho, Jean-Paul; Taniel, Gerard; and Viel, Georges, 4,370,555, Cl. 378-120.000.

Societe d'Application Plastique Mecanique et Electronique: *See—*
Dronet, Jean-Marc, 4,370,118, Cl. 425-305.100.

Societe de vente de L'Aluminium Pechniney: *See—*
Lyonnet, Christian, 4,369,562, Cl. 29-527.100.

Societe Industrielle LeSaffre: *See—*
Clement, Philippe; and Rossi, Jean-Paul, 4,370,420, Cl. 435-256.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See—*
Silhouette, Jean-Max M., 4,369,658, Cl. 73-507.000.

Soejima, Shigeo: *See—*
Watanabe, Tetsuo; Mase, Syunzo; and Soejima, Shigeo, 4,370,393, Cl. 429-193.000.

Soibelman, Steven P.: *See—*
Frazer, Spencer; and Soibelman, Steven P., 4,369,857, Cl. 181-159.000.

Solomon, Frank, to Diamond Shamrock Corporation. Non-bleeding electrode. 4,370,284, Cl. 264-42.000.

Soma, Kenichiro; Kuma, Shoji; Sakaguchi, Harunori; Shirai, Hisanari; Ito, Ryoichi; and Shiina, Toshio, to Hitachi Cable Limited. Polyolefin compositions for electrical insulation. 4,370,517, Cl. 174-74.00A.

Someshwar, Ashok H., to Motorola, Inc. Integrated circuit having elements for selectively forming an RC or a crystal oscillator. 4,370,625, Cl. 331-49.000.

Sonoco Products Company: *See—*
Bedenbaugh, William E., 4,369,933, Cl. 242-125.100.

Sony Corporation: *See—*
Akagiri, Kenzo, 4,370,681, Cl. 360-68.000.
Hongu, Masayuki; Omuro, Shigeru; Kita, Hiroyuki; and Tokuhara, Masaharu, 4,370,676, Cl. 358-188.000.
Hosoi, Sadao; and Takano, Masayuki, 4,370,685, Cl. 360-77.000.
Katoh, Noboru; and Kimura, Akio, 4,370,686, Cl. 360-96.300.

Sorbier, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for molding articles from agglomerated particles. 4,370,112, Cl. 425-3.000.

Sorenson, Wayne P., to American Can Company. Fibrous web structure and its manufacture. 4,370,289, Cl. 264-113.000.

Spangenberg, Stanley F.; Finley, Arlington L.; and Searson, D. James, to Dow Chemical Company, The. Electrolytic cell and anode for molten salt electrolysis. 4,370,216, Cl. 204-243.00R.

Spawn Mate, Inc.: *See—*
Holtz, R. Barry, 4,370,159, Cl. 71-5.000.

Specht, David F.: *See—*
D'Aurora, Joseph R.; and Specht, David F., 4,369,973, Cl. 273-153.00R.

Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. Sterile docking process, apparatus and system. 4,369,779, Cl. 128-213.00A.

Sperry Corporation: *See—*
Chu, James C.; Crane, Patrick E.; D'Agostino, Jack V.; and Schwartz, Paul M., 4,370,659, Cl. 343-772.000.
Lucchi, George A., 4,370,652, Cl. 343-5.0SM.

Spies, Henry J. Helical filament winding apparatus. 4,369,934, Cl. 242-157.100.

Spiro, Murray. Apparatus for feeding sheets. 4,369,962, Cl. 271-11.000.

Sprague, Robert A.; Turner, William D.; and Hartke, David H., to Xerox Corporation. Dielectric interface for proximity coupled electro-optic devices. 4,370,029, Cl. 350-355.000.

Sprague, Robert A., to Xerox Corporation. Extended resolution light deflector using surface acoustic waves. 4,370,030, Cl. 350-358.000.

Sprangle, Phillip A.; Smith, Robert A.; and Chu, Kwo R., to United States of America, Navy. High efficiency gyrotron oscillator and amplifier. 4,370,621, Cl. 330-4.000.

Stacker, Poul: *See*—
Nielsen, Erik S.; and Stacker, Poul, 4,369,619, Cl. 57-58.340.
Stacklies, Horst: *See*—
Trotscher, Otto; Stacklies, Horst; and Machler, Meinrad, 4,370,058, Cl. 356-125.000.
Stahl, Curt: *See*—
Baldwin, Dorothy M.; Oharek, Frank J.; and Stahl, Curt, 4,370,677, Cl. 358-225.000.
Stahly, Barbara C.; and Stahly, G. P., to Ethyl Corporation. Nucleophilic substitution process. 4,370,278, Cl. 260-465.00E.
Stahly, G. P.: *See*—
Stahly, Barbara C.; and Stahly, G. P., 4,370,278, Cl. 260-465.00E.
Stammann, Gunter; Becker. Robert; Grolig, Johann; and Waldmann, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid esters. 4,370,275, Cl. 260-463.000.
Standard Manufacturing Company, Incorporated: *See*—
Mankey, Harry S., 4,369,989, Cl. 280-763.000.
Standard Oil Company (Indiana): *See*—
Balint, Nikolaous K., 4,370,457, Cl. 526-137.000.
Goddin, Clifton S., Jr.; and McGalliard, Russell L., 4,370,156, Cl. 62-17.000.
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,370,166, Cl. 106-97.000.
Stange, Klaus K.: *See*—
Damouth, David E.; Mott, George R.; and Stange, Klaus K., 4,370,047, Cl. 355-3.0BE.
Starkina, Marina Y.: *See*—
Gebel, Ionif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.
Start, John F.: *See*—
Liao, Hsiang P.; Mohr, Richard A.; and Start, John F., 4,370,251, Cl. 252-186.420.
Staver, Peter J.; and Meyering, Clinton. Medical instrumentation electrode apparatus. 4,369,793, Cl. 128-643.000.
Stein, Harald: *See*—
Forster, Franz; and Stein, Harald, 4,370,100, Cl. 417-218.000.
Steiner, Rudolf: *See*—
Herbrechtsmeier, Peter; Schafer, Hans; and Steiner, Rudolf, 4,370,151, Cl. 55-38.000.
Steinke, Leo; Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Optical engine knock sensing system. 4,369,748, Cl. 123-425.000.
Stejskal, Miroslav: *See*—
Dressler, Mirko; Formanek, Vojtech; Michl, Vaclav; and Stejskal, Miroslav, 4,369,824, Cl. 144-343.000.
Stella, Joseph A., to Polaroid Corporation. Dual web sound movie cassette with emulsion stripping web. 4,370,035, Cl. 352-78.00R.
Stempel, John A., to Cavitron Corporation. Denture means and method. 4,370,133, Cl. 433-171.000.
Stenger, Antoine: *See*—
Mouzin, Gilbert; Cousse, Henri; and Stenger, Antoine, 4,370,347, Cl. 424-324.000.
Stengl, Gerhard; and Loschner, Hans, to Rudolf Sacher Gesellschaft m.b.H. Self-supporting mask, method for production as well as use of same. 4,370,556, Cl. 250-503.100.
Stepan Chemical Company: *See*—
Wechsler, Joseph R.; and Lane, Mark, 4,370,272, Cl. 260-404.000.
Stephan, Wolfgang: *See*—
Kotitschke, Ronald; and Stephan, Wolfgang, 4,370,264, Cl. 260-112.00B.
Sterling Drug Inc.: *See*—
Wesseler, Eugene P., 4,370,443, Cl. 524-612.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Zedrosser, Ulrich; and Malhotra, Satish K., 4,369,593, Cl. 42-70.00F.
Sticht, Walter. Apparatus for the manufacture and/or handling of workpieces. 4,369,872, Cl. 198-339.000.
Stirn, Richard J., to California Institute of Technology. Gallium arsenide single crystal solar cell structure and method of making. 4,370,510, Cl. 136-262.000.
Stone & Webster Engineering Corp.: *See*—
Woebcke, Herman N.; Bhojwani, Arju H.; Gartside, Robert J.; and Johnson, Axel R., 4,370,303, Cl. 422-144.000.
Stoy, Vladimir A., to S.K.Y. Polymers. Novel block copolymers including acrylonitrile sequences and sequences including units derived from glutarimide units and processes for preparing same. 4,370,451, Cl. 525-294.000.
Stratton, Susan D.: *See*—
Cason, William C.; Kuecker, Ward A.; and Stratton, Susan D., 4,370,645, Cl. 340-709.000.
Straub, Willy, to Kirchner, Georg. Body exercising device. 4,369,969, Cl. 272-144.000.
Straus, Isidor: *See*—
Dash, Glen R.; and Straus, Isidor, 4,370,570, Cl. 307-270.000.
Stravitz, David M. Tape cassette storage and carrying case. 4,369,883, Cl. 206-387.000.
Strom, Peter F.: *See*—
Koopman, Benjamin L.; Lau, Antonio O.; Strom, Peter F.; and Jenkins, David, 4,370,418, Cl. 435-289.000.
Stubbs, John K.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Ham, Allan L.; and Stubbs, John K., 4,370,328, Cl. 424-250.000.
Studiengesellschaft Kohle mbH: *See*—
Bogdanovic, Borislav, 4,370,488, Cl. 549-429.000.
Stuntz, Gordon F.: *See*—
Bearden, Roby; and Stuntz, Gordon F., 4,370,220, Cl. 208-108.000.
Subramanian, Pallatheri M.: *See*—
Mahr, Tibor G.; and Subramanian, Pallatheri M., 4,370,212, Cl. 204-159.140.
Sucker, Heinz: *See*—
de Buman, Alain; Riva, Aldo; and Sucker, Heinz, 4,369,784, Cl. 128-271.000.
Sudreau, Bernard: *See*—
de Sivry, Bruno; Sudreau, Bernard; Carsac, Claude; Hamon, Jean-Pierre; and Fuzeau, Michel, 4,370,541, Cl. 219-121.0EC.
Sugahara, Yoshikazu: *See*—
Mori, Yasuyuki; Nishimura, Haruo; and Sugahara, Yoshikazu, 4,370,300, Cl. 422-108.000.
Sugalski, Raymond K., to General Electric Company. Shuttle plate guide for automatic winding machines. 4,369,571, Cl. 29-731.000.
Sugawara, Tamio: *See*—
Igarashi, Kikuo; Honma, Tsunetoshi; and Sugawara, Tamio, 4,370,475, Cl. 536-16.800.
Sugi, Fumio, to Aisan Kogyo Kabushiki Kaisha. Variable venturi carburetor. 4,369,749, Cl. 123-439.000.
Sugimoto, Tadahiro, to Daito Seiki Company Limited. Metal-sawing machine. 4,369,686, Cl. 83-801.000.
Sugita, Mitsuyuki: *See*—
Ikeno, Hitoshi; Konno, Tetsuro; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,370,584, Cl. 310-365.000.
Sugiyama, Matsuyoshi: *See*—
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, 4,369,924, Cl. 239-703.000.
Sugiyama, Matuyoshi: *See*—
Morishita, Teru; Sugiyama, Matuyoshi; and Suzuki, Toshikazu, 4,369,925, Cl. 239-703.000.
Sugiyama, Toshihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Pressure mediated diesel engine exhaust gas recirculation control system. 4,369,753, Cl. 123-569.000.
Sullivan, James E. Cooking table. 4,369,763, Cl. 126-276.000.
Sullivan, Patrick: *See*—
Egly, Robert A.; and Sullivan, Patrick, 4,369,879, Cl. 206-45.180.
Sullivan, Thomas; and Braddock, James E., to Bicc Limited. Transportation systems and electric cables for use therein. 4,370,076, Cl. 405-132.000.
Sulzer Brothers Limited: *See*—
Tylmann, Josef, 4,370,230, Cl. 210-289.000.
Sumitomo Electric Industries, Ltd.: *See*—
Hara, Akio; and Yazu, Shuji, 4,370,149, Cl. 51-309.000.
Hayashi, Kyozo, 4,369,831, Cl. 164-415.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Arimatsu, Toshio; and Sakon, Tohatirou, 4,370,283, Cl. 264-37.000.
Summers, James W.: *See*—
Nehmey, Samuel D.; and Summers, James W., 4,370,286, Cl. 264-53.000.
Summey, Walter R. Shoes. 4,369,589, Cl. 36-77.00R.
Sundberg, Borje E. I. Fastening element. 4,370,082, Cl. 411-61.000.
Sundstrand Corporation: *See*—
Faulkner, Dennis T.; Glennon, Timothy F.; and Markunas, Albert L., 4,370,560, Cl. 290-40.00C.
Sunohara, Yoshio; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Lock-up control system for a torque converter. 4,369,865, Cl. 192-3.310.
Surgical Design: *See*—
Banko, Anton, 4,370,131, Cl. 433-86.000.
Suspendex (Proprietary) Limited: *See*—
Barker, William I.; and Denham, Ernest J., 4,370,185, Cl. 156-565.000.
Suzuki, Akira; and Shioya, Yasumi, to Shinryo Air Conditioning Co., Ltd. Method of treating excess sludge. 4,370,235, Cl. 210-620.000.
Suzuki, Kenpei; Koya, Shimichi; and Sato, Hiroshi, to Takeda Riken Kogyo Kabushikikaisha. Contact drive assembly for use with electronic part test equipment. 4,370,011, Cl. 339-74.00R.
Suzuki, Masakazu: *See*—
Furuichi, Shuhei; and Suzuki, Masakazu, 4,370,752, Cl. 378-110.000.
Suzuki, Noboru: *See*—
Ichinose, Isao; Mori, Fumio; and Suzuki, Noboru, 4,370,190, Cl. 156-307.300.
Suzuki, Toshikazu: *See*—
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, 4,369,924, Cl. 239-703.000.
Morishita, Teru; Sugiyama, Matuyoshi; and Suzuki, Toshikazu, 4,369,925, Cl. 239-703.000.
Suzuoka, Akihiro; Okuhira, Toshifumi; Matsumura, Eiji; and Sasaki, Katsushi, to Teijin Limited. Machine for solid phase polymerization. 4,370,302, Cl. 422-137.000.
Swanson, Richard G., to Macristy Industries, Inc. Liquid flow control strainer. 4,369,531, Cl. 4-295.000.
Swartout, Christopher A.: *See*—
Huffman, Stanley S.; Neel, Alan F.; Swartout, Christopher A.; and Dvorak, Neil E., 4,370,723, Cl. 364-483.000.
Swartz, LeRoy O., to Cleveland Gear Company. Process of continuous metal coating. 4,370,357, Cl. 427-46.000.
Sweigart, Raymond H.; and Doersom, Mary E., to RCA Corporation. In-line electron gun and method for modifying the same. 4,370,593, Cl. 313-414.000.
Swetly, Peter: *See*—
Jung, Gunther; Bruckner, Hans; Swetly, Peter; and Bozler, Gerhard, 4,370,312, Cl. 424-1.500.

Szarka, David D.; and Baker, Eugene E., to Halliburton Company. Anchor and anchor positioner assembly. 4,369,840, Cl. 166-214.000.
Szentes, John F., to Caterpillar Tractor Co. Non-contacting multi-function sensor arrangement. 4,369,651, Cl. 73-119.00A.
Tabuchi, Hiroshi: *See*—
Lord, Steven M.; and Tabuchi, Hiroshi, 4,369,725, Cl. 114-40.000.
Tachikawa, Hiromichi; Takahashi, Yohonosuke; Ishii, Kazuo; Ikeda, Tomoaki; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Desensitizing solution for lithographic printing plate. 4,370,404, Cl. 430-302.000.
Tackett, James E., Jr., to Marathon Oil Company. Process for drying surfactant-containing crude oil. 4,370,238, Cl. 210-639.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Color signal processing device for video recorder. 4,370,680, Cl. 358-330.000.
Taguchi, Tetsuya: *See*—
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, 4,370,037, Cl. 354-23.00D.
Taguchi, Yoshio: *See*—
Umemura, Yukio; Yoshida, Isao; Taguchi, Yoshio; and Iwasa, Yoshio, 4,369,739, Cl. 123-41.740.
Takada, Juichiro. Coupling assembly for connecting a slider to a drive wire in a passive vehicle occupant restraint belt system. 4,369,990, Cl. 280-804.000.
Takagi, Hiroshi: *See*—
Morikawa, Hiroshi; Kumazawa, Toshiharu; and Takagi, Hiroshi, 4,370,004, Cl. 308-10.000.
Takagi, Tatsuya. Stabilizer fitting apparatus. 4,369,988, Cl. 280-689.000.
Takahashi, Hiroshi: *See*—
Murakami, Sanpei; Kokeguchi, Sadao; Takahashi, Hiroshi; and Okada, Ken, 4,370,352, Cl. 426-557.000.
Takahashi, Kazutoshi: *See*—
Iwakura, Ryoji; Nitta, Tatsuo; and Takahashi, Kazutoshi, 4,370,067, Cl. 368-202.000.
Takahashi, Kenji; and Takanashi, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Cathode assembly. 4,370,588, Cl. 313-270.000.
Takahashi, Yohonosuke: *See*—
Tachikawa, Hiromichi; Takahashi, Yohonosuke; Ishii, Kazuo; Ikeda, Tomoaki; and Shinozaki, Fumiaki, 4,370,404, Cl. 430-302.000.
Takahashi, Yosuke: *See*—
Sato, Masatoshi; and Takahashi, Yosuke, 4,370,027, Cl. 350-164.000.
Takahashi, Yukio; Arikawa, Yoshijiro; and Yakushiji, Yoshio, to Babcock-Hitachi, Ltd. Catalytic structure for treating exhaust gases and a process for making the catalytic structure. 4,370,262, Cl. 252-464.000.
Takahashi, Yukio, to Fujitsu Limited. Termination circuit for word lines of a semiconductor memory device. 4,370,736, Cl. 365-155.000.
Takahata, Masahiro: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Takaishi, Yukio: *See*—
Takeda, Nobuhiro; Mizuno, Shigeo; Hattori, Masaichi; and Takaishi, Yukio, 4,370,638, Cl. 335-186.000.
Takaki, Kiyofumi, to Arai, Tokuji; and Takle, Birger. Photopolymerizable radiation-sensitive resin composition and radiation-sensitive sheet material. 4,370,403, Cl. 430-271.000.
Takamizawa, Minoru; Abe, Akira; Kasahara, Katsusuke; Komeno, Yukito; and Aoyama, Akira, to Shin-Etsu Chemical Co., Ltd.; and Agehara Orimono Kogyo K.K. Method for imparting water-repellency to woven fabrics. 4,370,365, Cl. 427-387.000.
Takamizawa, Minoru: *See*—
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,370,385, Cl. 428-429.000.
Takanashi, Yukio: *See*—
Takahashi, Kenji; and Takanashi, Yukio, 4,370,588, Cl. 313-270.000.
Takano, Masayuki: *See*—
Hosoi, Sadao; and Takano, Masayuki, 4,370,685, Cl. 360-77.000.
Takaya, Takao; and Tozuka, Zenzaburo, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds and composition. 4,370,326, Cl. 424-246.000.
Takeda, Hisao: *See*—
Tanaka, Katsutoshi; Takeda, Hisao; Kawano, Mutsumi; and Miyahara, Isao, 4,370,464, Cl. 528-99.000.
Takeda, Nobuhiro; Mizuno, Shigeo; Hattori, Masaichi; and Takaishi, Yukio, to Tokai Rika Co., Ltd. Double-function solenoid operated switch. 4,370,638, Cl. 335-186.000.
Takeda Riken Kogyo Kabushikikaisha: *See*—
Suzuki, Kenpei; Koya, Shinichi; and Sato, Hiroshi, 4,370,011, Cl. 339-74.00R.
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, to Pioneer Electronic Corporation. FM Receiver for use with motorcars. 4,370,522, Cl. 179-1.0GD.
Takeda, Yukio: *See*—
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Okoshi, Tokio, 4,370,421, Cl. 501-88.000.
Takei, Hirofumi: *See*—
Kubozuka, Takao; and Takei, Hirofumi, 4,369,744, Cl. 123-198.00E.
Takenouchi, Mutsuo: *See*—
Fuse, Mario; and Takenouchi, Mutsuo, 4,370,360, Cl. 427-76.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Kawamura, Kenji; and Fukatsu, Shunzo, 4,370,318, Cl. 424-177.000.
Takeyama, Tetsu: *See*—
Doi, Kunihiro; Takeyama, Tetsu; and Azuma, Kenkoku, 4,370,301, Cl. 422-122.000.
Takle, Birger: *See*—
Takaki, Kiyofumi, 4,370,403, Cl. 430-271.000.
Tamagawa Kikai Kabushiki Kaisha: *See*—
Watanabe, Takashi, 4,370,119, Cl. 425-352.000.
Tamamura, Hideo: *See*—
Harigaya, Isao; and Tamamura, Hideo, 4,370,043, Cl. 354-173.000.
Tamura, Takeo; Kido, Takayoshi; and Nakamura, Tatsuo, to Nissan Motor Co., Ltd.; and Ichikoh Industries Limited. Mirror apparatus having wiper means. 4,369,542, Cl. 15-250.00B.
Tanaka, Katsutoshi; Takeda, Hisao; Kawano, Mutsumi; and Miyahara, Isao, to Kyoritsu Yuki Co., Ltd.; and Mitsubishi Chemical Industries, Ltd. Cationic polymer flocculant. 4,370,464, Cl. 528-99.000.
Tanaka, Masato: *See*—
Ogata, Ikuei; Kawabata, Yasuziro; Tanaka, Masato; and Hayashi, Teruyuki, 4,370,258, Cl. 252-429.00R.
Taniel, Gerard: *See*—
Brethon, Jean-Pierre; Guiho, Jean-Paul; Taniel, Gerard; and Viel, Georges, 4,370,555, Cl. 378-120.000.
Tanigawa, Koichi: *See*—
Kuge, Tsukasa; Tanigawa, Koichi; and Adachi, Hiroyuki, 4,370,049, Cl. 355-3.0DD.
Tanikawa, Isao: *See*—
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, 4,370,368, Cl. 428-35.000.
Tanner, Joseph F.: *See*—
Roberts, Michael G.; and Tanner, Joseph F., 4,370,435, Cl. 524-312.000.
Tanno, Tadashi: *See*—
Kinoshita, Hiromi; Maeda, Yoshinobu; and Tanno, Tadashi, 4,369,819, Cl. 140-105.000.
Tarbox, Bruce H.: *See*—
Bruce, Kenneth E.; Conway, John W.; Lombardo, Ralph M., Jr.; and Tarbox, Bruce H., 4,370,708, Cl. 364-200.000.
Tarc, Andrew. Display tile for electronic chess game. 4,369,975, Cl. 273-237.000.
Tashiro, Isao: *See*—
Hou, Shou L.; and Tashiro, Isao, 4,370,662, Cl. 346-75.000.
Tashiro, Minoru; and Uemura, Takaaki, to Bunri Industry Co., Ltd. Magnetic belt conveyor type magnetic particle separator. 4,370,228, Cl. 210-223.000.
Task, Harry L.; Courtright, John F.; and Salys, Casimer K., to United States of America, Air Force. Dynamic binary fourier filtered imaging system. 4,370,024, Cl. 350-162.120.
Tateoka, Masamichi, to Canon Kabushiki Kaisha. Projection lens. 4,370,032, Cl. 350-476.000.
Tatro, Michael J., to Wausau Metals Corporation. Supplemental window and blind unit. 4,369,828, Cl. 160-107.000.
Tatsukawa, Osami: *See*—
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, 4,370,545, Cl. 219-491.000.
Tavor, Chanany, to Amiad Mutzarei Yiul. Liquid metering injector assembly. 4,369,805, Cl. 137-101.310.
Taylor, Edmund P., to Bryant-Poff, Inc. Automatic grain distributor. 4,369,870, Cl. 193-23.000.
Taylor, Ralph C., Jr.: *See*—
Berenberg, John A.; Haggerty, William A.; Kegg, Richard L.; Schmenk, Myron J.; and Taylor, Ralph C., Jr., 4,370,721, Cl. 364-474.000.
Taylor, Richard S.: *See*—
Bailey, Arvin K., Jr.; and Taylor, Richard S., 4,370,516, Cl. 174-59.000.
TDK Electronics Co., Ltd.: *See*—
Hosaka, Akihiko; Isobe, Yukihiro; and Okuyama, Kiyotaka, 4,370,384, Cl. 428-425.900.
Kawahara, Hiroshi, 4,370,383, Cl. 428-425.900.
Sasaki, Setsuo, 4,370,698, Cl. 361-330.000.
Technion Research and Development Foundation, Ltd.: *See*—
Neeman, Ishak; and Gaffin, Stephen L., 4,370,413, Cl. 435-39.000.
Tecumseh Products Company: *See*—
Gannaway, Edwin L., 4,370,099, Cl. 417-32.000.
Teed, Richard K.; and Pressley, Arther M., to Riegel Textile Corporation. Method and apparatus for drawing and blending textile materials. 4,369,622, Cl. 57-315.000.
Teichmann, Theodor, to Texas Gas Transmission Corporation. Method and apparatus for nuclear thermochemical water cracking. 4,370,297, Cl. 376-148.000.
Teijin Limited: *See*—
Suzuoka, Akihiro; Okuhira, Toshifumi; Matsumura, Eiji; and Sasaki, Katsushi, 4,370,302, Cl. 422-137.000.
Terzoni, Giuseppe: *See*—
Ancillotti, Francesco; Terzoni, Giuseppe; Micucci, Lidio; Maggioni, Paolo; and Panseri, Pietro, 4,370,506, Cl. 568-785.000.
Tetra Pak Developpement SA: *See*—
Petersen-Hoj, Peter, 4,370,293, Cl. 264-514.000.
Tetzner, Siegfried K. Wrapping apparatus. 4,369,614, Cl. 53-556.000.
Texas Brine Corporation: *See*—
Mondshine, Thomas C., 4,369,843, Cl. 166-292.000.
Texas Gas Transmission Corporation: *See*—
Teichmann, Theodor, 4,370,297, Cl. 376-148.000.

Texas Instruments Incorporated: *See—*
Brantingham, George L., 4,370,647, Cl. 340-784.000.
Henderson, Alva; and Hoy, Douglas B., 4,370,628, Cl. 331-111.000.
Lear, Anthony, 4,370,567, Cl. 307-252.00T.
McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,370,575, Cl. 307-530.000.
Thermoset AG: *See—*
Smith, Stuart B., 4,370,117, Cl. 425-224.000.
Thiel, Max: *See—*
Kampe, Wolfgang; Thiel, Max; Fauland, Erich; Bicker, Uwe; and Hebold, Gottfried, 4,370,323, Cl. 424-244.000.
Thies, Jurgen: *See—*
Klein, Alfons; Wedemeyer, Karlfried; and Thies, Jurgen, 4,370,505, Cl. 568-734.000.
Thim, Lars: *See—*
Jorgensen, Klavs H.; Jorgensen, Karin D.; and Thim, Lars, 4,370,317, Cl. 424-177.000.
Thiokol Corporation: *See—*
Lundstrom, Norman H.; and Shaw, Graham C., 4,370,181, Cl. 149-2.000.
Thomas, John H., to Kerotest Manufacturing Corp. Pipe stopper method and apparatus. 4,369,813, Cl. 138-94.000.
Thomas, Michael W., to Westinghouse Electric Corp. Shielding device for electrical inductive structure. 4,370,512, Cl. 174-18.000.
Thomason, Harry E.; and Thomason, Harry J. L., Jr. Solar heat storage system. 4,369,764, Cl. 126-400.000.
Thomason, Harry J. L., Jr.: *See—*
Thomason, Harry E.; and Thomason, Harry J. L., Jr., 4,369,764, Cl. 126-400.000.
Thompson, Charles T.: *See—*
Burnett, William R.; and Thompson, Charles T., 4,370,083, Cl. 411-87.000.
Thompson, Robert P., to RCA Corporation. Preform method of synthesizing a phosphor. 4,370,287, Cl. 264-67.000.
Thomson-CSF: *See—*
Dassonville, Jacques, 4,370,607, Cl. 323-271.000.
Dubroeucq, Georges; Lacombat, Michel; and Brevignon, Michele, 4,370,026, Cl. 350-163.000.
Puech, Claude; Arditty, Herve; and Papuchon, Michel, 4,370,612, Cl. 324-117.00R.
Tonnel, Eugene, 4,369,561, Cl. 29-576.00W.
Thornton, Jack C.: *See—*
Hornbeck, Sherman J.; and Thornton, Jack C., 4,370,622, Cl. 330-207.00P.
Thorsrud, Agmund K.: *See—*
Siedenstrang, Roy W.; and Thorsrud, Agmund K., 4,370,189, Cl. 156-272.200.
Thouvenin, Philippe: *See—*
Bugnet, Andree; Thouvenin, Philippe; and Cotteret, Jean, 4,370,142, Cl. 8-407.000.
Thring, Robert H., to Ricardo Consulting Engineers Limited. Catalytic combustion engines. 4,369,746, Cl. 123-261.000.
Tilse, Wilhelm K. P. H., to Timex Corporation. Coil/core assembly with interference fit. 4,370,578, Cl. 310-42.000.
Timex Corporation: *See—*
Tilse, Wilhelm K. P. H., 4,370,578, Cl. 310-42.000.
Tin, Lucas K., to Ampex Corporation. Efficient high performance envelope detector with controlled decay envelope detection. 4,370,620, Cl. 329-192.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,370,257, Cl. 252-429.00B.
Toagosei Chemical Industry Co., Ltd.: *See—*
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, 4,370,387, Cl. 428-458.000.
Toan, Tran: *See—*
Greff, Daniel; Petit-Martenon, Francoise; and Toan, Tran, 4,370,315, Cl. 424-94.000.
Tobin, Thomas J., to S&C Electric Company. Electric switch and improved device using same. 4,370,531, Cl. 200-151.000.
Toffolo, Walter E.: *See—*
Purcell, John R.; Chen, Wilkie Y.; and Toffolo, Walter E., 4,369,636, Cl. 62-514.00R.
Tokai Rika Co., Ltd.: *See—*
Takeda, Nobuhiro; Mizuno, Shigeo; Hattori, Masaichi; and Takaishi, Yukio, 4,370,638, Cl. 335-186.000.
Tokuhara, Masaharu: *See—*
Hongu, Masayuki; Omuro, Shigeru; Kita, Hiroyuki; and Tokuhara, Masaharu, 4,370,676, Cl. 358-188.000.
Tokuno, Masateru, to Rengo Co., Ltd. Method and apparatus for guiding a corrugated fibreboard web. 4,369,905, Cl. 226-17.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Andow, Fumio; and Fujisawa, Norio, 4,370,571, Cl. 307-353.000.
Azuma, Makoto; and Akagi, Junko, 4,370,180, Cl. 148-187.000.
Morozumi, Shotaro, 4,370,299, Cl. 420-429.000.
Nagano, Katsumi; and Kubo, Daijiro, 4,370,608, Cl. 323-316.000.
Noda, Tomimitsu, 4,370,535, Cl. 219-10.55B.
Saito, Tamio, 4,370,699, Cl. 361-406.000.
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, 4,370,731, Cl. 364-900.000.
Shibuya, Kunihiro; Uchida, Koichi; and Hashimoto, Shinichi, 4,370,048, Cl. 355-3.0TR.
Shiraishi, Fumitake, Fujioka, Masahiko; and Fujiki, Masao, 4,370,687, Cl. 360-98.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,370,680, Cl. 358-330.000.
Takahashi, Kenji; and Takanashi, Yukio, 4,370,588, Cl. 313-270.000.
Tolonen, William J.; and Pitchford, Armin C., to Phillips Petroleum Co. Producing minimum asphalt-containing cationic emulsions employing specific conductance. 4,370,170, Cl. 106-277.000.
Tomimoto, Tetsuo; Nagaoka, Yoshitomi; Sasaki, Reiichi; and Oyama, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Signal generator for a color television transmitting system. 4,370,673, Cl. 358-21.00R.
Tominaga, Yoshiitsu: *See—*
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, 4,370,387, Cl. 428-458.000.
Tomizawa, Yoshio, to Olympus Optical Co., Ltd. Electronic counter circuit for tape recorder. 4,370,549, Cl. 235-92.0MP.
Tonnel, Eugene, to Thomson-CSF. Process for aligning diffusion masks with respect to isolating walls of coffers in integrated circuits. 4,369,561, Cl. 29-576.00W.
Toomey, Daniel G.: *See—*
Duddles, Allen L.; and Toomey, Daniel G., 4,370,700, Cl. 361-424.000.
Toray Industries, Inc.: *See—*
Deguchi, Yukichi; Noguchi, Yukio; and Kobayashi, Hiroaki, 4,370,469, Cl. 528-388.000.
Kazama, Takahiko; Okamura, Yuji; and Fujita, Saburo, 4,370,291, Cl. 264-210.700.
Okamoto, Miyoshi; and Asada, Miyozo, 4,370,114, Cl. 425-131.500.
Torikata, Akio: *See—*
Arai, Mamoru; Haneishi, Tatsuo; Nakajima, Mutsuo; Torikata, Akio; and Enokita, Ryuzo, 4,370,266, Cl. 260-112.50R.
Toshimitsu, Yoshihiko: *See—*
Nishikawa, Masao; Toshimitsu, Yoshihiko; and Aoki, Takashi, 4,369,695, Cl. 91-375.00A.
Nishikawa, Masao; Toshimitsu, Yoshihiko; Iwasaki, Akira; and Fujimoto, Katsuhiko, 4,369,852, Cl. 180-148.000.
Toudo, Kenzi: *See—*
Miyanaka, Motoshi; Toudo, Kenzi; Kudo, Yoshinori; and Nakagawa, Sumio, 4,370,126, Cl. 431-73.000.
Toyama Chemical Company, Ltd.: *See—*
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, 4,370,368, Cl. 428-35.000.
Ichinose, Isao; Mori, Fumio; and Suzuki, Noboru, 4,370,190, Cl. 156-307.300.
Toyoda, Tsutomu; Maekawa, Iwao; Izumi, Hirobumi; and Fuzii, Tadashi, to Hitachi Chemical Company, Ltd. Method for manufacture of polybutadiene-modified unsaturated polyester. 4,370,446, Cl. 525-36.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hirayama, Tsutomu, 4,369,738, Cl. 123-41.100.
Ito, Sumio, 4,369,736, Cl. 123-1.00A.
Iwata, Yasuo; and Shirai, Hisao, 4,369,558, Cl. 29-148.40R.
Morishita, Teru; Sugiyama, Matsuyoshi; and Suzuki, Toshikazu, 4,369,924, Cl. 239-703.000.
Morishita, Teru; Sugiyama, Matuyoshi; and Suzuki, Toshikazu, 4,369,925, Cl. 239-703.000.
Sarai, Hiroshi; Hamada, Eiichi; and Ueda, Norihiro, 4,370,005, Cl. 384-154.000.
Sugiyama, Toshihisa, 4,369,753, Cl. 123-569.000.
Tozuka, Zenzaburo: *See—*
Takaya, Takao; and Tozuka, Zenzaburo, 4,370,326, Cl. 424-246.000.
Tracor, Inc.: *See—*
Fosdick, Robert E., 4,370,709, Cl. 364-200.000.
Transcanada Pipelines Ltd.: *See—*
Richardson, Anthony C., 4,369,713, Cl. 104-138.00G.
Trapanese, Salvatore P.: *See—*
Finch, Harvey E.; and Trapanese, Salvatore P., 4,370,274, Cl. 260-412.300.
Trick, Robert E., to Medical Engineering Corporation. Penile erectile system. 4,369,771, Cl. 128-79.000.
Trigg, Donald L. Band saw blade. 4,369,685, Cl. 83-661.000.
Tripp, Dwight E., to Arrowhead Research. Piston pump with discharge valve, inlet valve and misalignment compensating means in a pump head. 4,370,103, Cl. 417-298.000.
Troponwerke GmbH & Co. KG: *See—*
Jacobi, Haireddin; and Opitz, Wolfgang, 4,370,342, Cl. 424-275.000.
Trotscher, Otto; Stacklies, Horst; and Machler, Meinrad, to Carl Zeiss-Stiftung. Digital focimeter and method. 4,370,058, Cl. 356-125.000.
TRW Inc.: *See—*
Cosand, Albert E.; and de Graaf, Kenneth B., 4,370,572, Cl. 307-353.000.
Hayden, Rodney, 4,370,565, Cl. 307-141.000.
Tsuda, Hisatsugu: *See—*
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Tufco Corporation: *See—*
Beasley, Max M., 4,369,720, Cl. 112-79.00A.
Tung-Chen, Chen: *See—*
Min-Chin, Chen; and Tung-Chen, Chen, 4,369,644, Cl. 72-92.000.

Tunzini-Nessi Enterprises d'Equipements: *See*—
Meunier, Georges; and Martin, Jean-Francois, 4,369,834, Cl. 165-104.160.
Turkdogan, Ethem T., to United States Steel Corporation. Ore reduction using calcium oxide desulfurization. 4,370,161, Cl. 75-34.000.
Turner, William D.: *See*—
Sprague, Robert A.; Turner, William D.; and Hartke, David H., 4,370,029, Cl. 350-355.000.
Tutwiler, Gene: *See*—
Mohrbacher, Richard; Ho, Winston; and Tutwiler, Gene, 4,370,343, Cl. 424-275.000.
Tyler, Derek E.: *See*—
Pryor, Michael J.; and Tyler, Derek E., 4,369,832, Cl. 164-472.000.
Tyler Refrigeration Corporation: *See*—
Abraham, Fayez F., 4,369,631, Cl. 62-82.000.
Abraham, Fayez F., 4,369,632, Cl. 62-82.000.
Tylmann, Josef, to Sulzer Brothers Limited. Drainpipe for a reversible drainpipe filter system. 4,370,230, Cl. 210-289.000.
Ube Industries, Ltd.: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; and Shimazaki, Hiroshi, 4,370,290, Cl. 264-184.000.
Nagasawa, Toshio; and Nishihara, Yoshio, 4,370,548, Cl. 219-549.000.
Uchida, Koichi: *See*—
Shibuya, Kunihiro; Uchida, Koichi; and Hashimoto, Shinichi, 4,370,048, Cl. 355-3.0TR.
Uchidoi, Masanori; Iwashita, Tomonori; Taguchi, Tetsuya; Iura, Yukio; Ichiyanagi, Toshikazu; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Digital control camera. 4,370,037, Cl. 354-23.00D.
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, to Fujisawa Pharmaceutical Co., Ltd. Benzothiazol-2-one-3-alkanoic acids and esters and aldose reductase inhibiting compositions thereof. 4,370,340, Cl. 424-274.000.
Ueda, Minoru, to Yoshida Kogyo K.K. Method of manufacturing slide fasteners. 4,369,560, Cl. 29-408.000.
Ueda, Nobuhiro: *See*—
Wakabayashi, Noriaki; Fukumoto, Terumichi; and Ueda, Nobuhiro, 4,370,577, Cl. 310-12.000.
Ueda, Norihiro: *See*—
Sarai, Hiroshi; Hamada, Eiichi; and Ueda, Norihiro, 4,370,005, Cl. 384-154.000.
Ueda, Takashi; Minami, Syuji; Kioka, Mamoru; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for polymerizing or copolymerizing olefins. 4,370,455, Cl. 526-125.000.
Uekita, Masakazu; and Abe, Masaharu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Electrical laminate. 4,370,191, Cl. 156-307.700.
Uekita, Masakazu; Fushiki, Yasuo; and Abe, Masaharu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Reinforced unsaturated polyester resin laminate. 4,370,386, Cl. 428-458.000.
Uemura, Takaaki: *See*—
Tashiro, Minoru; and Uemura, Takaaki, 4,370,228, Cl. 210-223.000.
Ueno, Hiroshi: *See*—
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,370,257, Cl. 252-429.00B.
Ueno, Nagaharu; Oka, Joji; Asano, Hidejiro; Ogasawara, Takahisa; Mizutani, Kiyokazu; and Tominaga, Yoshiitsu, to Toagosei Chemical Industry Co., Ltd.; and Nippon Steel Corporation. Pre-coated steel sheets and process for production thereof. 4,370,387, Cl. 428-458.000.
Ueno, Sadayasu; Sato, Kanemasa; Oyama, Yoshishige; Nishimura, Yutaka; and Miya, Kazuhiko, to Hitachi, Ltd. Air intake measuring device for internal combustion engine. 4,369,656, Cl. 73-204.000.
Uhle, Karlheinz; and Kramer, Horst, to Hoechst Aktiengesellschaft. Testing method for determining the magnetic properties of ferromagnetic powders. 4,369,648, Cl. 73-61.400.
Uhle, Karlheinz; and Kramer, Horst, to Hoechst Aktiengesellschaft. Testing method for determining the magnetic properties of ferromagnetic powders. 4,369,649, Cl. 73-61.400.
Uhlig, Albert R., to Owens-Illinois, Inc. Container with expansion type locking closure. 4,369,892, Cl. 220-320.000.
Ulmer, Richard W.: *See*—
Allgood, Robert N.; Keiley, Stephen H.; Ulmer, Richard W.; and Wurzburg, Henry, 4,370,632, Cl. 333-173.000.
Umemura, Yukio; Yoshida, Isao; Taguchi, Yoshio; and Iwasa, Yoshio, to Nissan Motor Company, Limited. Structure of a cylinder assembly for an internal combustion engine. 4,369,739, Cl. 123-41.740.
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Kawamura, Kenji; and Fukatsu, Shunzo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Bestatin-related compounds as immunopotentiator. 4,370,318, Cl. 424-177.000.
Umezawa, Michio: *See*—
Jinnai, Koichiro; and Umezawa, Michio, 4,369,964, Cl. 271-260.000.
Underwater and Marine Equipment Limited: *See*—
Humphrey, Kenneth M., 4,369,814, Cl. 138-120.000.
Ungeř, Hans W.: *See*—
Backstein, Guenter; Unger, Hans W.; Guenther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,369,709, Cl. 102-229.000.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, 4,369,979, Cl. 277-212.0FB.
Unie van Kunstmestfabrieken, B.V.: *See*—
Hendriks, Petrus F. A. M.; Jansen, Arie; van den Berg, Willem B.; and Hoek, Cornelis, 4,370,304, Cl. 422-224.000.
Union Carbide Corporation: *See*—
George, Kathleen F., 4,370,456, Cl. 526-125.000.
Nagaura, Toru; and Aita, Takayuki, 4,370,395, Cl. 429-219.000.
Salensky, George A., 4,370,382, Cl. 428-418.000.
United States of America
Air Force: *See*—
Gergis, Isoris S., 4,370,734, Cl. 365-12.000.
Task, Harry L.; Courtright, John F.; and Salys, Casimer K., 4,370,024, Cl. 350-162.120.
Army: *See*—
LeBell, Clarence E.; and Barr, Samuel R., Sr., deceased, 4,369,937, Cl. 244-53.00R.
Manion, Francis M.; and Paras, Charles E., 4,369,811, Cl. 137-819.000.
Masak, Raymond J., 4,370,655, Cl. 343-100.0LE.
Weiner, Maurice; and Beattie, William, 4,370,597, Cl. 315-58.000.
Energy: *See*—
Davis, Jefferson W., Jr., 4,370,493, Cl. 562-444.000.
Foster, John S., Jr.; Wilson, James R.; and McDonald, Charles A., Jr., 4,370,576, Cl. 310-10.000.
Pennell, William E.; and Honigsberg, Charles A., 4,369,893, Cl. 220-378.000.
National Aeronautics and Space Administration: *See*—
Hoover, Richard B., 4,370,750, Cl. 378-43.000.
Navy: *See*—
Baldwin, Dorothy M.; Oharek, Frank J.; and Stahl, Curt, 4,370,677, Cl. 358-225.000.
Gerber, Robert L.; and Raper, Larry C., 4,370,631, Cl. 333-106.000.
Kaloi, Cyril M., 4,370,657, Cl. 343-700.0MS.
Sprangle, Phillip A.; Smith, Robert A.; and Chu, Kwo R., 4,370,621, Cl. 330-4.000.
U.S. Philips Corporation: *See*—
Bosch, Gerrit; Kok, Arnoldus W.; and Giethoorn, Harmen, 4,369,567, Cl. 29-607.000.
Bugg, Richard E. F.; and Parkyn, Derek J., 4,370,747, Cl. 375-62.000.
Khoe, Giok D.; Gossink, Robert G.; and Jochem, Cornelis M. G., 4,370,021, Cl. 350-96.180.
Notelteirs, Victor R., 4,370,587, Cl. 313-113.000.
Rijckaert, Albert M. A., 4,370,619, Cl. 328-133.000.
Roger, Bernard, 4,370,179, Cl. 148-175.000.
Schofield, John, 4,370,633, Cl. 333-195.000.
Schoofs, Franciscus A. C. M.; Nijman, Aloysius J.; and van Dongen, Frederik, 4,370,526, Cl. 179-51.0AA.
Willemsen, Petrus J. M.; Konijnendijk, Willem L.; and Peters, Robert C., 4,370,595, Cl. 313-486.000.
United States Steel Corporation: *See*—
Bingel, John P.; and Salmi, Robert W., 4,370,225, Cl. 209-40.000.
Brownell, George L.; Davie, William R.; and Fields, Marvin C., 4,370,240, Cl. 210-673.000.
Chou, Clifford K. F.; and McCarthy, Paul, 4,369,802, Cl. 134-122.00R.
Lowenhaupt, Douglas E., 4,370,201, Cl. 201-1.000.
Shepard, James N., 4,370,087, Cl. 414-421.000.
Turkdogan, Ethem T., 4,370,161, Cl. 75-34.000.
United Technologies Corporation: *See*—
Davis, Jack W.; and Blaszuk, Paul R., 4,370,540, Cl. 219-121.0LM.
Hanson, Donald B.; and Metzger, Frederick B., 4,370,097, Cl. 416-228.000.
University of Akron, The: *See*—
Savinell, Robert F.; and Liu, Chung-Chiun, 4,370,392, Cl. 429-15.000.
University of California, The Regents of the: *See*—
Dill, Ken A.; Zimm, Bruno H.; and Shafer, Richard H., 4,370,242, Cl. 210-787.000.
Faulkner, D. John, 4,370,484, Cl. 548-316.000.
Koopman, Benjamin L.; Lau, Antonio O.; Strom, Peter F.; and Jenkins, David, 4,370,418, Cl. 435-289.000.
University of Florida: *See*—
Miller, Gary J., 4,369,772, Cl. 128-92.00C.
University of Missouri, The Curators of the: *See*—
Barker, Clark R., 4,369,850, Cl. 175-393.000.
Uno, Masaaki: *See*—
Izumi, Eiki; Honma, Kazuo; Abe, Katsuro; Uno, Masaaki; and Nakajima, Kichio, 4,369,625, Cl. 60-327.000.
UOP Inc.: *See*—
Pujado, Peter R., 4,370,205, Cl. 203-75.000.
Upchurch, Thurman H.; and Bianco, Gerardo A., Jr., to AMSTED Industries Incorporated. Control of centrifugal pipe casting operation. 4,370,719, Cl. 364-472.000.
Uraneck, Carl A.; and Clark, Earl, to Phillips Petroleum Company. Emulsion polymerization process utilizing a highly dispersed organosulfur molecular weight modifier. 4,370,252, Cl. 252-311.000.
Usher, Thomas C.; and Hattori, Izu. Dextran polycarboxylic acids, ferric hydroxide complexes. 4,370,476, Cl. 536-113.000.
Ushida, Susumu, to Alps Electric Co. Ltd. Output coupling circuit for LC local oscillator. 4,370,626, Cl. 331-96.000.
Usinor: *See*—
Namy, Gerald; and Cordier, Jean, 4,370,154, Cl. 55-309.000.
USM Corporation: *See*—
Hanson, Raymond; and White, Anthony M., 4,369,536, Cl. 12-1.00A.
Ustav pro vyzkum motorovych vozidel: *See*—
Jahoda, Stanislav, 4,369,747, Cl. 123-278.000.
Utagawa, Ken: *See*—
Fukuhara, Toru; and Utagawa, Ken, 4,370,551, Cl. 250-201.000.

Utsumi, Hiroshi: *See*—
Sasaki, Yutaka; Nakamura, Tomio; Nakamura, Yoshimi; Moriya, Kiyoshi; Utsumi, Hiroshi; and Saito, Shigeru, 4,370,279, Cl. 260-465.300.

Vadetec Corporation: *See*—
Kemper, Yves J., 4,369,667, Cl. 74-191.000.

Vahlensieck, Hans-Joachim: *See*—
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,370,204, Cl. 203-39.000.

Vallee, Guy, to Northern Telecom Limited. High capacity change-over power supply fuse. 4,370,639, Cl. 337-230.000.

Valyi, Emery I. Apparatus for forming hollow plastic objects. 4,370,121, Cl. 425-526.000.

Van Doorne's Transmissie B.V.: *See*—
van Deursen, Petrus H., 4,369,675, Cl. 74-864.000.

Van Bouwel, Leo; Geyken, Erwin; Ertl, Franz; and Fleck, Adolf, to AGFA-Gevaert Aktiengesellschaft. Method and apparatus for processing exposed photographic material with bath constituent supply outlet openings at different levels. 4,370,046, Cl. 354-324.000.

Vance, Ronald D.: *See*—
Bourgraf, Elroy E.; Dunn, Robert E.; and Vance, Ronald D., 4,369,985, Cl. 280-641.000.

Vandebult, Jan. Process for fabricating resonant tag circuit constructions. 4,369,557, Cl. 29-25.420.

van den Berg, Willem B.: *See*—
Hendriks, Petrus F. A. M.; Jansen, Aric; van den Berg, Willem B.; and Hoek, Cornelis, 4,370,304, Cl. 422-224.000.

Vander Horst, John. Constant delivery inertia pump. 4,370,101, Cl. 417-241.000.

Vandermarliere, Charles: *See*—
Curinier, Jean; and Vandermarliere, Charles, 4,369,554, Cl. 28-101.000.

van Deursen, Petrus H., to Van Doorne's Transmissie B.V. Method and apparatus for controlling an infinitely variable transmission of a motor vehicle. 4,369,675, Cl. 74-864.000.

Vandling, John M., deceased; and Vandling, Patricia, executrix. Method of and apparatus for load and/or load control signaling to customers in a power system. 4,370,563, Cl. 307-40.000.

Vandling, Patricia, executrix: *See*—
Vandling, John M., deceased; and Vandling, Patricia, executrix, 4,370,563, Cl. 307-40.000.

van Dongen, Frederik: *See*—
Schoofs, Franciscus A. C. M.; Nijman, Aloysius J.; and van Dongen, Frederik, 4,370,526, Cl. 179-51.0AA.

Van Doorn, Donald W.; and Hawkins, James B., to Lummus Industries, Inc. Inside-out cutter for elongated material such as tow. 4,369,681, Cl. 83-100.000.

Van Gaalen, Neil. Moving dam waterway cleaner. 4,369,735, Cl. 119-3.000.

Vangelov, Ivan V.: *See*—
Beloev, Marin G.; Vangelov, Ivan V.; Garlanov, Dimo T.; Nikov, Nikolay Y.; Savov, Ivan S.; and Hlebarov, Vladimir P., 4,369,919, Cl. 239-79.000.
Garlanov, Dimo T.; Beloev, Marin G.; Hlebarov, Vladimir P.; Kolarova, Mariana V.; and Vangelov, Ivan V., 4,370,539, Cl. 219-121.0PW.

VanPatten, John R., to General Electric Company. Electromagnetic dual break contactor. 4,370,636, Cl. 335-132.000.

Varian Associates, Inc.: *See*—
Burnett, William R.; and Thompson, Charles T., 4,370,083, Cl. 411-87.000.
Ward, Curtis E., 4,370,547, Cl. 219-497.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,369,706, Cl. 101-365.000.

Veda, Inc.: *See*—
Buschbom, Floyd E.; and Hutchison, Marion, 4,369,855, Cl. 180-212.000.

Veldhoen, Hendrik: *See*—
Backstein, Guenter; Unger, Hans W.; Guenther, Michael; Kaltbeitzer, Dieter; and Veldhoen, Hendrik, 4,369,709, Cl. 102-229.000.

Venturello, Giorgio; and Salvatore, Osvaldo, to Centro Ricerche Fiat S.p.A. Transducer with six degrees of freedom. 4,369,663, Cl. 73-862.040.

Vest, H. Ryland; and Boone, Walter S., to Alba-Waldensian, Inc. Garment for maintaining body temperature and method of making same. 4,369,528, Cl. 2-69.000.

VI po Hranitelna I Vkussova Promishlenost: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,370,473, Cl. 536-2.000.

Vicino, Robert K. Inflatable display structure. 4,369,591, Cl. 40-610.000.

Victor Company of Japan, Ltd.: *See*—
Hiraguri, Seisuke, 4,370,524, Cl. 179-15.55T.
Hirata, Atsumi, 4,370,740, Cl. 369-276.000.
Katoh, Hiroshi, 4,370,682, Cl. 360-71.000.
Kitamura, Masatsugu, 4,370,643, Cl. 340-347.0SH.

Vidsurri, Fernando C.; and Anderson, Kenneth L., to Phillips Petroleum Company. Multistage, agitated contactor and its use in continuous production of arylene sulfide polymer. 4,370,470, Cl. 528-388.000.

Viel, Georges: *See*—
Brethon, Jean-Pierre; Guiho, Jean-Paul; Taniel, Gerard; and Viel, Georges, 4,370,555, Cl. 378-120.000.

Vikre, Merle A. Sprinkler head for a center pivot irrigation system. 4,369,922, Cl. 239-454.000.

Visca, Mario, to Sibit, S.p.A. Catalyst for the photo-decomposition of water and process for the preparation of the catalyst. 4,370,263, Cl. 252-472.000.

Vitale, Steven. Pipe cutter. 4,369,573, Cl. 30-105.000.

Vogel, Heinz-Rudiger: *See*—
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; and Koch, Gerhard, 4,370,244, Cl. 252-39.000.

Volan, Daniel, to Luchaire S.A. External revetment panel for buildings. 4,369,610, Cl. 52-509.000.

von Beckmann, Helmuth, to Canron Corporation. Railroad tamping machine. 4,369,712, Cl. 104-12.000.

Vorves, Steve P. Strike plate support. 4,369,994, Cl. 292-340.000.

Vossen, John L., Jr.; and Halon, Bernard, to RCA Corporation. Anisotropic etching of aluminum. 4,370,196, Cl. 156-643.000.

Vossen, John L., Jr.: *See*—
Halon, Bernard; and Vossen, John L., Jr., 4,370,195, Cl. 156-643.000.

Vredestein N.V.: *See*—
Ekkerink, Pierre J., 4,369,535, Cl. 5-481.000.

Vukovic, Marko. Arthroscope. 4,369,768, Cl. 128-6.000.

Vyas, Ramesh M.: *See*—
Wagner, Theodore; Vyas, Ramesh M.; and Liang, Samuel, 4,370,648, Cl. 340-825.200.

Vyzkumny ustav bavlnarsky: *See*—
Burysek, Frantisek; Mikulecky, Karel; Elias, Jiri; Esner, Stanislav; Skoda, Stanislav; and Janousek, Jan, 4,369,620, Cl. 57-267.000.

Vyzkumny ustav leanibo hospodarstvi a myslivosti: *See*—
Dresler, Mirko; Formanek, Vojtech; Michl, Vaclav; and Stejskal, Miroslav, 4,369,824, Cl. 144-343.000.

W. R. Grace & Co.: *See*—
Daane, Robert A., 4,369,584, Cl. 34-12.000.
Kim, Gwan, 4,370,260, Cl. 252-438.000.

WABCO Fahrzeugbremsen GmbH: *See*—
Klatt, Alfred; and Singbartl, Gunther, 4,369,696, Cl. 91-465.000.

Wada, Shozo: *See*—
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,370,257, Cl. 252-429.00B.

Wada, Yukio: *See*—
Fujishima, Nobuiti; Nakano, Hideharu; and Wada, Yukio, 4,370,544, Cl. 219-370.000.

Wadsworth-Greeswood Corporation: *See*—
Fox, Gary R., 4,369,640, Cl. 68-205.00R.

Wagner, Theodore; Vyas, Ramesh M.; and Liang, Samuel, to Siemens Corporation. Synchronizing circuit for use with a telecommunication system. 4,370,648, Cl. 340-825.200.

Waid, George M.; and Davenport, Anthony T., to Republic Steel Corporation. Method of making as-pierced tubular products. 4,370,178, Cl. 148-12.00F.

Wakabayashi, Noriaki; Fukumoto, Terumichi; and Ueda, Nobuhiro, to Matsushita Electric Industrial Co., Ltd. Linear motor. 4,370,577, Cl. 310-12.000.

Wakisaka, Yoshiharu: *See*—
Mitsugi, Takashi; Muneyuki, Ryonosuke; Wakisaka, Yoshiharu; Koizumi, Kenzo; and Kondo, Eiji, 4,370,414, Cl. 435-44.000.

Waldmann, Helmut: *See*—
Stammann, Gunter; Becker, Robert; Grolig, Johann; and Waldmann, Helmut, 4,370,275, Cl. 260-463.000.

Walker, Darrell W., to Phillips Petroleum Company. Zinc aluminate prepared using an alumina hydrate. 4,370,310, Cl. 423-600.000.

Walker, Michael J., to Lucas Industries Limited. Circuit for recognizing cyclically occurring pulse sequences. 4,370,618, Cl. 328-120.000.

Wallach, Erich. Timelock device. 4,369,641, Cl. 70-272.000.

Walter, John, to Continental Group, Inc., The. Closure for container. 4,369,888, Cl. 215-237.000.

Waltersdorfer, Anna: *See*—
Gildemeister, Horst; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Sachse, Burkhard, 4,370,320, Cl. 424-200.000.
Welter, Wolfgang; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Bonin, Werner, 4,370,345, Cl. 424-282.000.

Wandel & Goltermann GmbH & Co.: *See*—
Brandt, Dieter, 4,370,617, Cl. 328-63.000.

Wang, Chih C.; Pinch, Harry L.; and Bates, Ronald F., to RCA Corporation. Spinel video disc playback stylus. 4,370,739, Cl. 369-126.000.

Wang, Jish M.: *See*—
Berkowitz, Ami E.; Lahut, Joseph A.; and Wang, Jish M., 4,370,661, Cl. 346-74.500.

Ward, Curtis E., to Varian Associates, Inc. Variable thermal impedance. 4,370,547, Cl. 219-497.000.

Wareham, William M., to Bofors America, Inc. Pressure transducer. 4,369,659, Cl. 73-708.000.

Warner, Gene L. Kiln temperature controller. 4,370,546, Cl. 219-497.000.

Watanabe, Kenkichi; Furuya, Katsusuke; and Kimoto, Toyoki, to Laurel Bank Machine Co., Ltd. Coin handling apparatus having a signal operated blocker. 4,369,800, Cl. 133-8.00R.

Watanabe, Masazumi: *See*—
Okamura, Shigemichi; and Watanabe, Masazumi, 4,370,416, Cl. 435-197.000.

Watanabe, Takao: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Satoh, Susumu; and Watanabe, Takao, 4,370,340, Cl. 424-274.000.

Watanabe, Takashi, to Tamagawa Kikai Kabushiki Kaisha. Powder press. 4,370,119, Cl. 425-352.000.

Watanabe, Takeaki, to Nissan Motor Co., Ltd. Gasket for air conditioners. 4,369,978, Cl. 277-12.000.

Watanabe, Tetsuo; Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators Ltd. Solid electrolytes. 4,370,393, Cl. 429-193.000.

Watanabe, Tetsuo: *See*—
Oki, Shuichiro; and Watanabe, Tetsuo, 4,370,213, Cl. 204-195.00S.

Watase, Kenta: *See*—
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Kitamura, Takahiko, 4,369,733, Cl. 118-691.000.

Wausau Metals Corporation: *See*—
Tatro, Michael J., 4,369,828, Cl. 160-107.000.

Waycaster, Roy A.; Baker, William T.; and Bidle, Jerry D., to Sensors, Inc. Contaminated sample gas analyzer and gas cell therefor. 4,370,553, Cl. 250-343.000.

Wayland, Paul O., to Westinghouse Electric Corp. Electrolytic cell electrical shunting switch assembly. 4,370,530, Cl. 200-144.00B.

Weaks, William L.: *See*—
Cody, John M.; and Weaks, William L., 4,369,616, Cl. 56-11.300.

Weaver, Robert F., to Foremost-McKesson, Inc. Powder unloading apparatus. 4,370,084, Cl. 414-292.000.

Webb, Terry E.: *See*—
Hicks, Alan A.; Morrison, Howard J.; Wildman, John R.; and Webb, Terry E., 4,370,064, Cl. 368-93.000.

Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst. Method for dry cooling coke and coke cooler to implement the method. 4,370,202, Cl. 202-228.000.

Webster, Harold F., to General Electric Company. Method for writing on archival target and target produced thereby. 4,370,590, Cl. 313-391.000.

Wechsler, Joseph R.; and Lane, Mark, to Stepan Chemical Company. Alkoxylated quaternary ammonium surfactants. 4,370,272, Cl. 260-404.000.

Wedel, Gregory L., to Beloit Corporation. Dryer siphon. 4,369,586, Cl. 34-125.000.

Wedemeyer, Karlfried: *See*—
Klein, Alfons; Wedemeyer, Karlfried; and Thies, Jurgen, 4,370,505, Cl. 568-734.000.

Weeden, Frank G.: *See*—
Foster, Robert D.; and Weeden, Frank G., 4,370,120, Cl. 425-405.00H.

Weil, Burt: *See*—
Bourgraf, Elroy E.; Dunn, Robert E.; and Vance, Ronald D., 4,369,985, Cl. 280-641.000.

Weiner, Maurice; and Beattie, William, to United States of America, Army. Thyratron switch for narrow pulses. 4,370,597, Cl. 315-58.000.

Weingarten, Friedrich W.; Hunger, Klaus; and Klappert, Ernst, to Hoechst Aktiengesellschaft. Monoazo pigment derived from acetoacetylamino benzimidazolone. 4,370,269, Cl. 260-157.000.

Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; and Koch, Gerhard, to Akademie der Wissenschaften der DDR. Process for cold mechanical working of metallic materials. 4,370,244, Cl. 252-39.000.

Weiss, John. Wingsail. 4,369,724, Cl. 114-39.000.

Weldotron Corporation: *See*—
Millevoi, Eugenio, 4,369,878, Cl. 198-807.000.

Wella Aktiengesellschaft: *See*—
Herzig, Heinrich G.; and Rothfuss, Robert, 4,370,137, Cl. 434-94.000.

Wellman, Carl E., Jr.; and Hornung, Richard E., to General Electric Company. Ground fault protective system requiring reduced current-interrupting capability. 4,370,692, Cl. 361-109.000.

Welter, Wolfgang; and Mildenberger, Hilmar, to Hoechst Aktiengesellschaft. Phenoxy-cinnamyl alcohols. 4,370,277, Cl. 260-465.00F.

Welter, Wolfgang; Mildenberger, Hilmar; Knauf, Werner; Waltersdorfer, Anna; and Bonin, Werner, to Hoechst Aktiengesellschaft. Phenoxyphenylpropenyloxycarbonyl compounds and their use as insecticides and acaricides. 4,370,345, Cl. 424-282.000.

Wentworth, Robert J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Astley, Graham J., 4,369,541, Cl. 15-97.00B.

Weserhutte Aktiengesellschaft: *See*—
Heuer, Helmut; Schapsmeier, Wilhelm; and Fohlmeister, Hans D., 4,369,877, Cl. 198-509.000.

Wesseler, Eugene P., to Sterling Drug Inc. Novel polymeric compounds, processes and methods of use. 4,370,443, Cl. 524-612.000.

Western Electric Co., Inc.: *See*—
Franken, Jeffrey J.; Gladney, Walter W.; and Yeich, William R., 4,370,294, Cl. 264-571.000.
Hobart, Floyd E., Jr., 4,369,944, Cl. 248-56.000.
Lumley, Robert M., 4,370,568, Cl. 307-260.000.
Niesse, Paul J., 4,370,355, Cl. 427-9.000.
Penick, Loren C., 4,370,695, Cl. 361-213.000.

Western, Ralph E., to Rockwell International Corporation. Energy conserving drive circuit for switched mode converter utilizing current snubber apparatus. 4,370,701, Cl. 363-20.000.

Westfalia Separator AG: *See*—
Hemfort, Heinrich; Peitzmann, August; Neukotter, Wilhelm; Pautsch, Gunthard; and Guunnewig, Hubert, 4,369,698, Cl. 99-486.000.

Westinghouse Electric Corp.: *See*—
Bachr, Frederick J., Jr.; Kemeny, George A.; and Barber, John P., 4,369,691, Cl. 89-8.300.
Breznican, Stephen J., 4,370,605, Cl. 318-773.000.
Cookson, Alan H.; Fischer, William H.; Yoon, Kue H.; and Meyer, Jeffry R., 4,370,511, Cl. 174-14.00R.
DeCaro, Aristide R.; and Nixon, Henry M., 4,370,589, Cl. 313-315.000.
Franz, James H., Jr.; and Jones, Stanley W., 4,370,603, Cl. 318-523.000.
Hamm, James R.; and Young, William E., 4,369,624, Cl. 60-39.120.
Hummert, George T.; Moser, Thomas D.; and Edison, David M., 4,370,717, Cl. 364-436.000.
Kemeny, George A., 4,369,692, Cl. 89-8.000.
Kommineni, Prasad R., 4,370,513, Cl. 174-21.0JS.
Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,369,662, Cl. 73-862.010.
Shuey, Kenneth C.; and Rosswurm, Mark A., 4,370,702, Cl. 363-42.000.
Thomas, Michael W., 4,370,512, Cl. 174-18.000.
Wayland, Paul O., 4,370,530, Cl. 200-144.00B.

Westland Aircraft Limited: *See*—
Mills, John B.; and Roberts, Christopher H., 4,370,542, Cl. 219-121.0LH.

Westvaco Corporation: *See*—
Orndorff, Steve A., 4,370,199, Cl. 162-161.000.

Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, to Boehringer Ingelheim GmbH. Cephalosporins and pharmaceutical compositions. 4,370,327, Cl. 424-246.000.

Weyerhaeuser Company: *See*—
Muise, Herbert D., 4,369,913, Cl. 229-30.000.

Whirlpool Corporation: *See*—
Baker, Daniel A., 4,370,690, Cl. 361-23.000.
Nordeen, Erwin E., 4,369,539, Cl. 15-49.00C.

Whistler, Wayne J.; and Loveland, Robert S., to Perkin-Elmer Corporation, The. High speed temperature controlled electrometer. 4,370,615, Cl. 324-457.000.

White, Anthony M.: *See*—
Hanson, Raymond; and White, Anthony M., 4,369,536, Cl. 12-1.00A.

White, Charles C., Jr.: *See*—
Jones, Johnny O., Jr.; and White, Charles C., Jr., 4,370,602, Cl. 318-114.000.

White Consolidated Industries, Inc.: *See*—
Nelson, Richard T.; and Middleton, Marc G., 4,370,104, Cl. 417-312.000.

White, Jack: *See*—
Bird, Thomas O.; White, Jack; and Bird, Carl H., 4,370,249, Cl. 252-62.000.

White, Jack E.: *See*—
Bird, Thomas O.; White, Jack; and Bird, Carl H., 4,370,249, Cl. 252-62.000.

White, Lionel S., Jr.: *See*—
McAlexander, Joseph C., III; White, Lionel S., Jr.; and Rao, G. R. Mohan, 4,370,575, Cl. 307-530.000.

White, Ronald E.: *See*—
Wright, George C.; and White, Ronald E., 4,370,494, Cl. 562-450.000.

Whiteside, Ross C., Jr.; List, Adolphus V.; and Doorakian, George A., to Dow Chemical Co., The. Epoxy resins having improved physical properties when cured. 4,370,465, Cl. 528-104.000.

Widman, Lawrence E.; Habeeb, Nasser G.; and Darakjian, Raymond Z. Treatment for periodontal diseases. 4,370,136, Cl. 433-217.000.

Wierusz, Lech B.: *See*—
Bacal, Kazimierz; Wierusz, Lech B.; and Miszczyk, Janusz, 4,369,770, Cl. 128-69.000.

Wight, Edward M., to Glacier Industries, Inc. Automatic confection packaging machine. 4,369,612, Cl. 53-494.000.

Wildman, John R.: *See*—
Hicks, Alan A.; Morrison, Howard J.; Wildman, John R.; and Webb, Terry E., 4,370,064, Cl. 368-93.000.

Wilhelm, John J.: *See*—
Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,369,662, Cl. 73-862.010.

Wilka, Josef, to Bayerische Motoren Werke A.G. Installation for supporting a boat engine installed inboard at a transom plate. 4,370,138, Cl. 440-112.000.

Wilkes, Donald F. Backpack frame. 4,369,903, Cl. 224-213.000.

Willcox, Kenneth W.; and Randall, James C., to Phillips Petroleum Company. Nitrite-sorbate stabilizing system. 4,370,437, Cl. 524-397.000.

Willemsen, Petrus J. M.; Konijnendijk, Willem L.; and Peters, Robert C., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,370,595, Cl. 313-486.000.

Wm. Wrigley Jr. Company: *See*—
Fisher, E. Eugene; Estes, R. Ray; Lokken, Orvin D.; and Paquette, Elmer G., 4,370,350, Cl. 426-5.000.

Williams, Bruce T. Low impedance electrostatic detector. 4,370,616, Cl. 324-458.000.

Williams, Frank R.; and Hurst, Ronald C., to Cabot Corporation. Production of carbon black. 4,370,308, Cl. 423-450.000.

Williams, James E., to Cuisinarts Research & Development Inc. Method and apparatus for changing slicer cutting parameters in a rotary food processor. 4,369,680, Cl. 83-13.000.

Williams, Stanley B. Device for clamping and aligning plates to be joined in selected angular relationship. 4,369,957, Cl. 269-41.000.

Williamson, David T. N., to Molins Limited; and Smith, John Conventry, Jr. Automated machine tool installation with storage means. 4,369,563, Cl. 29-568.000.

Wilpon, Jay G.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., 4,370,521, Cl. 179-1.0SC.

Wilson, Delano D.; and Hedman, Dale E., to Power Technologies, Inc. Fault isolator for electric utility distribution systems. 4,370,609, Cl. 324-51.000.
Wilson, H. James, to Safetran Systems Corporation. Signal control system. 4,369,942, Cl. 246-34.0CT.
Wilson, Harold R.: *See*—
Haworth, Richard G.; Saylor, Charles J.; and Wilson, Harold R., 4,370,008, Cl. 339-4.000.
Wilson, Harry L.: *See*—
Muntean, George; Wilson, Harry L.; and Gant, Gary L., 4,369,750, Cl. 123-505.000.
Wilson, James R.: *See*—
Foster, John S., Jr.; Wilson, James R.; and McDonald, Charles A., Jr., 4,370,576, Cl. 310-10.000.
Wilt, Mason S.: *See*—
Allison, George M., III; and Wilt, Mason S., 4,370,433, Cl. 524-274.000.
Windischbauer, Florian: *See*—
Gehring, Fritz; Windischbauer, Florian; and Haussler, Horst, 4,369,815, Cl. 139-57.000.
Windischman, Edward F.: *See*—
Gilson, Richard W.; and Windischman, Edward F., 4,369,781, Cl. 128-214.00R.
Winslow, John M.; and Gatzke, Kenneth G., to Minnesota Mining and Manufacturing Company. Light sensitive, thermally developable imaging system. 4,370,401, Cl. 430-178.000.
Winsor, Donald L., to Raytheon Company. Slow-wave filter for electron discharge device. 4,370,596, Cl. 315-3.600.
Wistuba, Eckehardt: *See*—
Neubert, Gerhard; and Wistuba, Eckehardt, 4,370,460, Cl. 526-329.200.
Witherell, Nancy B. Folding wheeled chair/luggage carrier. 4,369,987, Cl. 280-644.000.
Woebcke, Herman N.; Bhojwani, Arju H.; Gartside, Robert J.; and Johnson, Axel R., to Stone & Webster Engineering Corp. Thermal regenerative cracking (TRC) apparatus. 4,370,303, Cl. 422-144.000.
Wohlgemuth, Juergen, to Siemens Aktiengesellschaft. Rotatable socket for a dental handpiece. 4,370,132, Cl. 433-128.000.
Woitun, Eberhard: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,370,327, Cl. 424-246.000.
Wolters, Erich: *See*—
Blank, Heinz U.; Wolters, Erich; Muller, Karl W.; and Rottloff, Gunter, 4,370,499, Cl. 564-200.000.
Wood, Donald H.: *See*—
Jones, Robert E.; and Wood, Donald H., 4,370,746, Cl. 371-27.000.
Woodworth, Raymond D.: *See*—
Rettich, Thomas A.; and Woodworth, Raymond D., 4,370,714, Cl. 364-426.000.
Wright, George C.; and White, Ronald E., to Norwich Eaton Pharmaceuticals, Inc. Converting enzyme inhibitors. 4,370,494, Cl. 562-450.000.
Wright, Ronald E. Center reinforced mattress. 4,369,534, Cl. 5-475.000.
Wulz, Klaus: *See*—
Messmer, Karlheinz; Fischer, Hermann; Hartmann, Heinrich; Denzinger, Walter; Schneider, Rolf; Wulz, Klaus; and Raubenheimer, Hans-Juergen, 4,370,454, Cl. 526-88.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, to Hoechst Aktiengesellschaft. Carrier catalyst for the preparation of vinyl acetate from ethylene, acetic acid and oxygen in the gaseous phase. 4,370,261, Cl. 252-460.000.
Wunder, Friedrich; Quadflieg, Therese; Roscher, Gunter; and Heck, Gunther, to Hoechst Aktiengesellschaft. Preparation of vinyl acetate from ethylene, acetic acid and oxygen in the gaseous phase. 4,370,492, Cl. 560-245.000.
Wunner, Roland, to LIBA Maschinenfabrik GmbH. Warp knitting machine apparatus. 4,369,639, Cl. 66-203.000.
Wurzburg, Henry: *See*—
Allgood, Robert N.; Kelley, Stephen H.; Ulmer, Richard W.; and Wurzburg, Henry, 4,370,632, Cl. 333-173.000.
Wylie, Mark E.: *See*—
Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,369,662, Cl. 73-862.010.
Wyzsza Szkola Inzynierska Im. J. Gagarina: *See*—
Bacal, Kazimierz; Wierusz, Lech B.; and Miszczyk, Janusz, 4,369,770, Cl. 128-69.000.
Xerox Corporation: *See*—
Damouth, David E.; Mott, George R.; and Stange, Klaus K., 4,370,047, Cl. 355-3.0BE.
Harvey, Raymond A., 4,369,908, Cl. 227-90.000.
Hays, Dan A., 4,370,056, Cl. 355-3.0DD.
Markham, Roger G., 4,370,663, Cl. 346-75.000.
Sprague, Robert A.; Turner, William D.; and Hartke, David H., 4,370,029, Cl. 350-355.000.
Sprague, Robert A., 4,370,030, Cl. 350-358.000.
Yabunaka, Kiyoshi: *See*—
Hamano, Isao; and Yabunaka, Kiyoshi, 4,369,910, Cl. 228-110.000.
Yagi, Naoki; Kim, Kwang Y.; Nakaji, Tarushige; and Fujisaki, Kazuuki, to Minsminihon Rakuno Kyodo Kabushiki Kaisha. Acid-resisting whipping cream powder and process for producing the same. 4,370,353, Cl. 426-570.000.
Yahata, Eiji. Belt with buckle. 4,369,529, Cl. 2-322.000.
Yakushiji, Yoshio: *See*—
Takahashi, Yukio; Arikawa, Yoshijiro; and Yakushiji, Yoshio, 4,370,262, Cl. 252-464.000.
Yamada, Kiyoshi: *See*—
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Kano, Toshiji; Yamada, Kiyoshi; and Hatta, Yoshio, 4,370,208, Cl. 204-98.000.
Yamada, Shigeo: *See*—
Oizumi, Toshiro; Ito, Tetsuro; and Yamada, Shigeo, 4,370,537, Cl. 219-69.00V.
Yamaguchi, Michio: *See*—
Morita, Masaaki; Yamaguchi, Michio; and Asano, Hiroyuki, 4,369,714, Cl. 104-250.000.
Yamaguchi, Nobuhide: *See*—
Ogawa, Tadao; and Yamaguchi, Nobuhide, 4,370,624, Cl. 330-294.000.
Yamaguchi, Sizuo, to Citizen Watch Company Limited. Correction signal input system for electronic timepiece. 4,370,066, Cl. 368-188.000.
Yamamoto, Hironori: *See*—
Isohata, Junji; and Yamamoto, Hironori, 4,370,054, Cl. 355-53.000.
Yamamoto, Kiyokazu: *See*—
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, 4,370,102, Cl. 417-296.000.
Yamamoto, Tadahiro; and Masaki, Kenji, to Nissan Motor Co., Ltd. Adjustable air flow sensor arrangement. 4,369,650, Cl. 73-118.000.
Yamanaka, Takeshi, to Omron Taieini Electronics Co. Tape cassette and tape transport mechanism. 4,369,935, Cl. 242-192.000.
Yamashita, Toshio: *See*—
Moriwaki, Yoshio; Gamou, Takaharu; Yanagihara, Nobuyuki; Yamashita, Toshio; and Iwaki, Tsutomu, 4,370,163, Cl. 420-582.000.
Yamat, Miguel B.: *See*—
Carroll, John T.; and Yamat, Miguel B., 4,370,635, Cl. 335-20.000.
Yamazaki, Etsuo: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,370,722, Cl. 364-474.000.
Yamazaki, Shuichi: *See*—
Niitsu, Mitsugi; Yamazaki, Shuichi; and Kimura, Shigeru, 4,370,013, Cl. 339-82.000.
Yanagi, Hirofumi: *See*—
Ikeno, Hitoshi; Konno, Tetsuro; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,370,584, Cl. 310-365.000.
Yanagihara, Nobuyuki: *See*—
Moriwaki, Yoshio; Gamou, Takaharu; Yanagihara, Nobuyuki; Yamashita, Toshio; and Iwaki, Tsutomu, 4,370,163, Cl. 420-582.000.
Yanase, Hiroshi; Kanno, Fukuo; and Abe, Takeshi, to Asahi Glass Company, Ltd. Encapsulation of electronic device. 4,370,292, Cl. 264-272.110.
Yasuda, Takashi: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Yazawa, Yukichi: *See*—
Hotta, Kouichi; Yazawa, Yukichi; and Tatsukawa, Osami, 4,370,545, Cl. 219-491.000.
Yazu, Shuji: *See*—
Hara, Akio; and Yazu, Shuji, 4,370,149, Cl. 51-309.000.
Yeda Research & Dev., Co., Ltd.: *See*—
Lwoff, Andre; Yerushalmi, Aaron; Cohen, Irun R.; Moshe, Gideon B.; and Pennell, Jack, 4,369,777, Cl. 128-200.140.
Yeich, William R.: *See*—
Franken, Jeffrey J.; Gladney, Walter W.; and Yeich, William R., 4,370,294, Cl. 264-571.000.
Yeigh, John H., Jr.: *See*—
McGovern, Stephen J.; and Yeigh, John H., Jr., 4,370,222, Cl. 208-113.000.
Yerushalmi, Aaron: *See*—
Lwoff, Andre; Yerushalmi, Aaron; Cohen, Irun R.; Moshe, Gideon B.; and Pennell, Jack, 4,369,777, Cl. 128-200.140.
Yoda, Makoto: *See*—
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,370,257, Cl. 252-429.00B.
Yokokura, Shuichi: *See*—
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,370,385, Cl. 428-429.000.
Yokoo, Akiro: *See*—
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,370,385, Cl. 428-429.000.
Yokoto, Takashi: *See*—
Minamitani, Eiji; Ozawa, Kiyoo; and Yokoto, Takashi, 4,370,742, Cl. 370-58.000.
Yokoyama, Junichi, to Nissan Motor Company, Limited. Control device for acceleration pump. 4,370,282, Cl. 261-34.00B.
Yokoyama, Youichi: *See*—
Kondo, Hideya; Yokoyama, Youichi; Aoyama, Youichi; and Mori, Tamotsu, 4,370,634, Cl. 335-16.000.
Yoneya, Shoji: *See*—
Murase, Isao; Hirose, Katsutoshi; and Yoneya, Shoji, 4,370,060, Cl. 356-417.000.
Yoon, Kue H.: *See*—
Cookson, Alan H.; Fischer, William H.; Yoon, Kue H.; and Meyer, Jeffry R., 4,370,511, Cl. 174-14.00R.

Yoshiba, Yutaka: *See*—
Horike, Masanori; Yoshiba, Yutaka; and Ebi, Yutaka, 4,370,664, Cl. 346-75.000.
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, to Kirin Beer Kabushiki Kaisha. Masking of abrasion injury on glass articles. 4,370,385, Cl. 428-429.000.
Yoshida, Isao: *See*—
Umemura, Yukio; Yoshida, Isao; Taguchi, Yoshio; and Iwasa, Yoshio, 4,369,739, Cl. 123-41.740.
Yoshida, Kazutoshi: *See*—
Futami, Toshio; and Yoshida, Kazutoshi, 4,370,735, Cl. 365-16.000.
Yoshida Kogyo K.K.: *See*—
Ueda, Minoru, 4,369,560, Cl. 29-408.000.
Yoshida, Tadahiro, 4,369,818, Cl. 139-452.000.
Yoshida, Mikihiko: *See*—
Igarashi, Toshiji; Nomura, Keiichi; Naito, Kunji; and Yoshida, Mikihiko, 4,370,472, Cl. 536-1.100.
Yoshida, Tadahiro, to Yoshida Kogyo K.K. Weft yarn feeder. 4,369,818, Cl. 139-452.000.
Yoshihara, Tsuyoshi; and Ohashi, Nobuaki, to Nippon Kinzoku Co., Ltd. Method and apparatus for continuously forming color display layer on stainless steel strip. 4,370,210, Cl. 204-140.000.
Yoshikawa, Kazuo: *See*—
Shinoda, Tsutae; Yoshikawa, Kazuo; and Miyashita, Yoshinori, 4,370,599, Cl. 315-217.000.
Yoshikawa, Nobuhisa: *See*—
Horii, Shigeru; Yoshikawa, Nobuhisa; and Koyama, Kazutaka, 4,370,601, Cl. 315-307.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,369,900, Cl. 222-321.000.
Yoshioka, Hiroshi: *See*—
Yoshida, Akiteru; Yokoo, Akiro; Yokokura, Shuichi; Takamizawa, Minoru; Inoue, Yoshio; and Yoshioka, Hiroshi, 4,370,385, Cl. 428-429.000.
Yoshioka, Tsutomu: *See*—
Miura, Toshikatsu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, 4,369,608, Cl. 52-309.900.
Yosim, Paul S.: *See*—
Kantor, Sherwood; Maddox, Randall A.; and Yosim, Paul S., 4,370,641, Cl. 340-146.30H.
Yotsuji, Akira: *See*—
Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Yotsuji, Akira; Takahata, Masahiro; Tsuda, Hisatsugu; Mikami, Hidetada; Sakai, Hiroshi; and Ohashi, Toshinori, 4,370,316, Cl. 424-98.000.
Young, William E.: *See*—
Hamm, James R.; and Young, William E., 4,369,624, Cl. 60-39.120.
Yuda, Takuo, to Nifco Inc. Buckle. 4,369,553, Cl. 24-230.00R.
Yunan, Malak E., to Du Pont de Nemours, E. I., and Company. Method and apparatus for producing a detonating cord. 4,369,688, Cl. 86-1.00R.
Zabrocki, Vincent S.; and Bussey, Marlin G., to Dow Chemical Company, The. Low density, extruded ethylenic polymer foams. 4,370,378, Cl. 428-339.000.
Zahnradfabrik Renk A.G.: *See*—
Pollak-Banda, Erich; and John, Erich, 4,369,668, Cl. 74-414.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Kawamura, Kenji; and Fukatsu, Shunzo, 4,370,318, Cl. 424-177.000.
Zansky, Zoltan, to Honeywell Inc. Two-wire electronic dimming ballast for fluorescent lamps. 4,370,600, Cl. 315-244.000.
Zdrojkowski, Ronald: *See*—
Rehkopf, Paul G.; and Zdrojkowski, Ronald, 4,369,785, Cl. 128-276.000.
Zedrosser, Ulrich; and Malhotra, Satish K., to Steyr-Daimler-Puch Aktiengesellschaft. Firing mechanism for pistols. 4,369,593, Cl. 42-70.00F.
Zeidman, Gordon G.: *See*—
Cooper, Donald L.; and Zeidman, Gordon G., 4,369,678, Cl. 81-90.00C.
Zenith Radio Corporation: *See*—
Capek, Raymond G.; and Garrett, Elgie E., 4,370,630, Cl. 333-24.00C.
Cohn, William E., 4,370,675, Cl. 358-108.000.
Johnson, Fred D.; Flasza, Michael D.; and Bretl, Wayne E., 4,370,674, Cl. 358-74.000.
Ziebert, Tony. Solid fuel supporting grate for fireplace. 4,369,762, Cl. 126-164.000.
Ziemelis, Maris J., to Dow Corning Corporation. Process for preparing silicone microparticles. 4,370,160, Cl. 71-117.000.
Zientara, Stanley V. Hand held tools and utensils stabilizer bar, adjustable and non-adjustable. 4,369,546, Cl. 16-110.00R.
Zigler, James D., to Reliance Electric Company. Variable speed V-belt sheaves. 4,370,139, Cl. 474-45.000.
Zimm, Bruno H.: *See*—
Dill, Ken A.; Zimm, Bruno H.; and Shafer, Richard H., 4,370,242, Cl. 210-787.000.
Zopf, David E., to CBS Industries. Loudspeaker pedestal. 4,369,949, Cl. 248-632.000.
Zopf, David E., to Complete Business Services Corp. Turntable support. 4,369,950, Cl. 248-632.000.
Zurga, Joe F. Magazine for muzzle loader. 4,369,594, Cl. 42-90.000.
Zykov, Arkady A.: *See*—
Gebel, Iosif D.; Zykov, Arkady A.; Lvov, Vladimir M.; Nefedov, Askold I.; Parshikov, Viktor I.; Starkina, Marina Y.; Klibanov, Mendel S.; Ryss, Alexandr S., deceased; and Ryss, Maria I., legal representative, 4,369,603, Cl. 51-236.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JANUARY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bebout, Robert W., to Totten, John. Wood turning process and apparatus for making cylindroconical wood products. Re. 31,130, Cl. 142-1.000.

Bunker Ramo Corporation: *See*—
Hoppe, Paul P., Jr., Re. 31,132, Cl. 339-97.00R.

Burke Company, The: *See*—
Torbet, Philip A.; and Eager, Thomas, Re. 31,131, Cl. 294-89.000.

Eager, Thomas: *See*—
Torbet, Philip A.; and Eager, Thomas, Re. 31,131, Cl. 294-89.000.

Hoppe, Paul P., Jr., to Bunker Ramo Corporation. Electrical connector and insulation-piercing contact member. Re. 31,132, Cl. 339-97.00R.

Lux, Robert J., Jr., to Thermodynamics Corporation. Ground level transformer unit. Re. 31,134, Cl. 336-65.000.

Niessner, Rudolf; and Sonnleitner, Max, to Thyssen Plastik Anger KG. Extrusion methods. Re. 31,133, Cl. 264-541.000.

Sonnleitner, Max: *See*—
Niessner, Rudolf; and Sonnleitner, Max, Re. 31,133, Cl. 264-541.000.

Thermodynamics Corporation: *See*—
Lux, Robert J., Jr., Re. 31,134, Cl. 336-65.000.

Thyssen Plastik Anger KG: *See*—
Niessner, Rudolf; and Sonnleitner, Max, Re. 31,133, Cl. 264-541.000.

Torbet, Philip A.; and Eager, Thomas, to Burke Company, The. Concrete slab hoisting apparatus. Re. 31,131, Cl. 294-89.000.

Totten, John: *See*—
Bebout, Robert W., Re. 31,130, Cl. 142-1.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Kempe, Carl, to Logging Development Corp. Felling head reciprocating blade type. B1 3,625,268, Cl. 144—34 E.

Logging Development Corp.: *See*—
Kempe, Carl, B1 3,625,268, Cl. 144—34 E.

Vernon, Richard I., to Lockheed Corporation. Unitized aircraft food and beverage service. B1 3,517,899, Cl. 244—118.5.

Lockheed Corporation: *See*—
Vernon, Richard I. B1 3,517,899. Cl. 244—118.5.

Rumbaugh, Paul S., to Altec Corporation. Modular printed circuit board assembly having cooling means incorporated therein. B1 4,122,508, Cl. 361—384.

Altec Corporation: *See*—
Rumbaugh, Paul S. B1 4,122,508, Cl. 361—384.

Sergovic, John A., to The Burns & Russell Company of Baltimore City. Method of producing cast surfaces and product obtained thereby. B1 3,328,231, Cl. 428—451.

Burns & Russell Company of Baltimore City, The: *See*—
Sergovic, John A. B1 3,328,231, Cl. 428—451.

# LIST OF DESIGN PATENTEES

A.B.L. Jewelers, Inc.: *See*—
Shapiro, Jeffrey H., 267,706, Cl. D11-34.000.

Acushnet Company: *See*—
Giebel, Charles; Rambo, Charles D.; and Spencer, Gary, 267,738, Cl. D21-217.000.

Adams, Eugene A. Contoured bed sheet. 267,696, 1-25-83, Cl. D6-264.000.

Albertsen, Peter S.: *See*—
Geiter, Robert A.; Albertsen, Peter S.; and Powell, Robert A., 267,741, Cl. D23-94.000.

Allen, James H., to 'Totes', Incorporated. Overshoe. 267,675, 1-25-83, Cl. D2-271.000.

Allen, James H., to 'Totes', Incorporated. Overshoe. 267,676, 1-25-83, Cl. D2-271.000.

Allibert S.A.: *See*—
Vrignaud, Guy, 267,685, Cl. D6-120.000.

Anchor Hocking Corporation: *See*—
Thrush, James L., 267,697, Cl. D7-11.000.

Ballereaud, Pierre. Cosmetic container. 267,749, 1-25-83, Cl. D28-76.000.

Barney, Ray H. Ground inserted holder for roasting fork or the like. 267,679, 1-25-83, Cl. D6-20.000.

Boyakin, Roderick R. Sculpture. 267,708, 1-25-83, Cl. D11-157.000.

Breen, John J. Baby seat. 267,678, 1-25-83, Cl. D6-7.000.

Bucchianeri, Richard M.: *See*—
Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., 267,743, Cl. D24-53.000.

Burke, Robert J. Clock. 267,704, 1-25-83, Cl. D10-6.000.

Canada Cycle and Motor Company Limited: *See*—
Livernois, John, 267,674, Cl. D2-28.000.

Caravan Camper Mfg. Co.: *See*—
Domes, David C., 267,698, Cl. D8-341.000.

Carlson, Ann. Indian doll. 267,730, 1-25-83, Cl. D21-182.000.

Carlson, Ann. Indian doll. 267,731, 1-25-83, Cl. D21-182.000.

Carlson, Ann. Indian doll. 267,732, 1-25-83, Cl. D21-182.000.

Carlson, Ann. Indian doll. 267,733, 1-25-83, Cl. D21-182.000.

Carlson, Ann. Indian doll. 267,734, 1-25-83, Cl. D21-182.000.

Carlson, Ann. Indian doll. 267,735, 1-25-83, Cl. D21-182.000.

Carlson, Ann. Indian doll. 267,736, 1-25-83, Cl. D21-182.000.

Case, Stanford E. Self-propelled drilling machine. 267,719, 1-25-83, Cl. D15-21.000.

Chase, David O.; and Pfuhl, Paul H., to Mobil Oil Corporation. Container lid or the like. 267,703, 1-25-83, Cl. D9-435.000.

CPG Products Corp.: *See*—
Pelavin, Joseph Y., 267,677, Cl. D3-71.000.

Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., to IVAC Corporation. Pressure diaphragm. 267,743, 1-25-83, Cl. D24-53.000.

Dawson, Donald R. Wall mounted flag case. 267,686, 1-25-83, Cl. D6-127.000.

Dentsply Research & Development Corp.: *See*—
Seeley, Wayne C., 267,745, Cl. D24-10.000.

Dobyns, Richard W. Golf club cleaner. 267,751, 1-25-83, Cl. D32-1.000.

Doe, Walter P., to Playskool, Inc. Toy riding horse. 267,727, 1-25-83, Cl. D21-75.000.

Domes, David C., to Caravan Camper Mfg. Co. Multiple access slide-lock. 267,698, 1-25-83, Cl. D8-341.000.

Drackett Company, The: *See*—
Pardo, John; and Jones, David A., 267,701, Cl. D9-372.000.

Dunlop Limited: *See*—
Tomoda, Hiroshi, 267,712, Cl. D12-136.000.

Dupuis, Jean-Claude; and Roudavitch, Georges, to Societe Francaise d'Equipments pour La Navigation Aerienne (S.F.E.N.A.). Linear actuator. 267,721, 1-25-83, Cl. D15-148.000.

Ehrenreich, Morris. Employability testing apparatus. 267,726, 1-25-83, Cl. D19-59.000.

Fehlbaum & Co.: *See*—
Muller-Deisig, Wolfgang, 267,681, Cl. D6-73.000.

Flynn, Mary E., to Sandspur Enterprises, Inc. Medical instrument support. 267,744, 1-25-83, Cl. D24-31.000.

Geiter, Robert A.; Albertsen, Peter S.; and Powell, Robert A., to Jamestown Group. Fireplace insert. 267,741, 1-25-83, Cl. D23-94.000.

Giebel, Charles; Rambo, Charles D.; and Spencer, Gary, to Acushnet Company. Putter head. 267,738, 1-25-83, Cl. D21-217.000.

Gostomski, John J., to Hellstar Corporation. Beam balanced pumping unit. 267,718, 1-25-83, Cl. D15-7.000.

GTE Automatic Electric Labs Inc.: *See*—
Janda, George M., 267,715, Cl. D14-60.000.
Janda, George M., 267,716, Cl. D14-60.000.

Hamada, Masanori: *See*—
Murakami, Shinzo; Takenaka, Kazumasa; Ohta, Kikuo; Hamada, Masanori; and Hoshino, Kunio, 267,717, Cl. D14-70.000.

Hara, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic copying machine with a computer system or the like. 267,723, 1-25-83, Cl. D16-28.000.

Hellstar Corporation: *See*—
Gostomski, John J., 267,718, Cl. D15-7.000.

Hoshino, Kunio: *See*—
Murakami, Shinzo; Takenaka, Kazumasa; Ohta, Kikuo; Hamada, Masanori; and Hoshino, Kunio, 267,717, Cl. D14-70.000.

Hughes, Royal W. Golf practice platform. 267,739, 1-25-83, Cl. D21-234.000.

IVAC Corporation: *See*—
Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., 267,743, Cl. D24-53.000.

Jamestown Group: *See*—
Geiter, Robert A.; Albertsen, Peter S.; and Powell, Robert A., 267,741, Cl. D23-94.000.

Janda, George M., to GTE Automatic Electric Labs Inc. Housing for a telephone instrument base. 267,715, 1-25-83, Cl. D14-60.000.

Janda, George M., to GTE Automatic Electric Labs Inc. Desk telephone housing. 267,716, 1-25-83, Cl. D14-60.000.

Jarrett, William E. Novelty pin. 267,707, 1-25-83, Cl. D11-48.000.

Jones, David A.: *See*—
Pardo, John; and Jones, David A., 267,701, Cl. D9-372.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kosugi, Nobuhiro, 267,705, Cl. D10-39.000.

Kane, Bernard D., executor: *See*—
Savage, Milton B., deceased; Savage, Sara, executor; and Kane, Bernard D., executor, 267,687, Cl. D6-157.000.

Kates, Fred W., to Revlon, Inc. Display unit. 267,682, 1-25-83, Cl. D6-85.000.

Kates, Fred W., to Revlon, Inc. Display unit. 267,683, 1-25-83, Cl. D6-85.000.

Kates, Fred W., to Revlon, Inc. Display unit. 267,692, 1-25-83, Cl. D6-186.000.

King, James F. Fifth wheel recreation vehicle. 267,710, 1-25-83, Cl. D12-103.000.

Knapheide Mfg. Co., The: *See*—
Leaver, John Y., 267,709, Cl. D12-96.000.

Kosugi, Nobuhiro, to Kabushiki Kaisha Daini Seikosha. Wristwatch. 267,705, 1-25-83, Cl. D10-39.000.

Lander, Lars B., to Molnlycke Aktiebolag. Combined toilet paper holder and dispenser. 267,684, 1-25-83, Cl. D6-97.000.

Lang, Karen: *See*—
Nuttall, Michael W.; and Lang, Karen, 267,729, Cl. D21-114.000.

Latino, Richard M.: *See*—
Paquette, Edmund T.; and Latino, Richard M., 267,695, Cl. D6-191.000.

Lawson, Peter, to Rockwell do Brasil Ind. E. Com. Ltda. Wood shaper. 267,720, 1-25-83, Cl. D15-130.000.

Leaver, John Y., to Knapheide Mfg. Co., The. Platform body for a truck. 267,709, 1-25-83, Cl. D12-96.000.

Leffler, Dennis F.; and Truette, Danny M., to Pelton and Crane Company, The. Chair. 267,680, 1-25-83, Cl. D6-30.000.

Litton Business Systems, Inc.: *See*—
Platner, Warren, 267,688, Cl. D6-162.000.
Platner, Warren, 267,689, Cl. D6-169.000.

Livernois, John, to Canada Cycle and Motor Company Limited. Hockey pants. 267,674, 1-25-83, Cl. D2-28.000.

Loncraine Broxton & Partners Limited: *See*—
Loncraine, Richard L., 267,728, Cl. D21-104.000.

Loncraine, Richard L., to Loncraine Broxton & Partners Limited. Puzzle toy. 267,728, 1-25-83, Cl. D21-104.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Murakami, Shinzo; Takenaka, Kazumasa; Ohta, Kikuo; Hamada, Masanori; and Hoshino, Kunio, 267,717, Cl. D14-70.000.

McFarland, George E., to Thermomatics Associates, Ltd. Halogen quartz lamp radiant heating module. 267,742, 1-25-83, Cl. D23-127.000.

Mita, Yoichi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mita, Yoichi; and Mochizuki, Masafumi, 267,714, Cl. D14-11.000.

Mobil Oil Corporation: *See*—
Chase, David O.; and Pfuhl, Paul H., 267,703, Cl. D9-435.000.

Mochizuki, Masafumi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mita, Yoichi; and Mochizuki, Masafumi, 267,714, Cl. D14-11.000.

Molnlycke Aktiebolag: *See*—
Lander, Lars B., 267,684, Cl. D6-97.000.

Moriarty, Frederick J.; and Paquette, Edmund T., to Wright Line Inc. Documentation hanger bar for library storage unit. 267,694, 1-25-83, Cl. D6-191.000.

Moriarty, Frederick J.: *See*—
Paquette, Edmund T.; and Moriarty, Frederick J., 267,693, Cl. D6-191.000.

Muller-Deisig, Wolfgang, to Fehlbaum & Co. Chair. 267,681, 1-25-83, Cl. D6-73.000.

Murakami, Shinzo; Takenaka, Kazumasa; Ohta, Kikuo; Hamada, Masanori; and Hoshino, Kunio, to Matsushita Electric Industrial Co., Ltd. Clock radio. 267,717, 1-25-83, Cl. D14-70.000.

Noda, Junichi; and Yanagisawa, Isao, to Tamura Seisakusho Co., Ltd. Combined electrical connector and adapter plug therefor. 267,713, 1-25-83, Cl. D13-24.000.

Norstrom, Sven E. Protective shoe for dogs. 267,750, 1-25-83, Cl. D30-34.000.

Nuttall, Michael W.; and Lang, Karen, to Tomy Corporation, Inc. Toy house. 267,729, 1-25-83, Cl. D21-114.000.

Ohta, Kikuo: *See*—
Murakami, Shinzo; Takenaka, Kazumasa; Ohta, Kikuo; Hamada, Masanori; and Hoshino, Kunio, 267,717, Cl. D14-70.000.

O'Leary, Stephen H.: *See*—
Cunningham, Joel N.; Bucchianeri, Richard M.; and O'Leary, Stephen H., 267,743, Cl. D24-53.000.

Paquette, Edmund T.; and Moriarty, Frederick J., to Wright Line Inc. Library unit for accepting cantilevered document-storing components. 267,693, 1-25-83, Cl. D6-191.000.

Paquette, Edmund T.; and Latino, Richard M., to Wright Line Inc. Documentation hanger bar. 267,695, 1-25-83, Cl. D6-191.000.

Paquette, Edmund T.: *See*—
Moriarty, Frederick J.; and Paquette, Edmund T., 267,694, Cl. D6-191.000.

Pardo, John; and Jones, David A., to Drackett Company, The. Bottle. 267,701, 1-25-83, Cl. D9-372.000.

Partex Fabriksaktiebolag: *See*—
Skarin, Lars, 267,700, Cl. D9-337.000.

Pelavin, Joseph Y., to CPG Products Corp. Garment bag. 267,677, 1-25-83, Cl. D3-71.000.

Pelton and Crane Company, The: *See*—
Leffler, Dennis F.; and Truette, Danny M., 267,680, Cl. D6-30.000.

Perego, Giuseppe. Extendable handle for collapsible perambulator. 267,711, 1-25-83, Cl. D12-133.000.

Pfuhl, Paul H.: *See*—
Chase, David O.; and Pfuhl, Paul H., 267,703, Cl. D9-435.000.

Plante, Emile A. P. Protective corner for lobster trap. 267,740, 1-25-83, Cl. D22-18.000.

Platner, Warren, to Litton Business Systems, Inc. Desk or similar article. 267,688, 1-25-83, Cl. D6-162.000.

Platner, Warren, to Litton Business Systems, Inc. Communication cabinet. 267,689, 1-25-83, Cl. D6-169.000.

Playskool, Inc.: *See*—
Doe, Walter P., 267,727, Cl. D21-75.000.

Polaroid Corporation: *See*—
Staller, Norman D., 267,724, Cl. D16-112.000.

Powell, Robert A.: *See*—
Geiter, Robert A.; Albertsen, Peter S.; and Powell, Robert A., 267,741, Cl. D23-94.000.

Prawl, William F. Air compressor bracket. 267,699, 1-25-83, Cl. D8-380.000.

Rambo, Charles D.: *See*—
Giebel, Charles; Rambo, Charles D.; and Spencer, Gary, 267,738, Cl. D21-217.000.

Revlon, Inc.: *See*—
Kates, Fred W., 267,682, Cl. D6-85.000.
Kates, Fred W., 267,683, Cl. D6-85.000.
Kates, Fred W., 267,692, Cl. D6-186.000.

Rockwell do Brasil Ind. E. Com. Ltda.: *See*—
Lawson, Peter, 267,720, Cl. D15-130.000.

Roudavitch, Georges: *See*—
Dupuis, Jean-Claude; and Roudavitch, Georges, 267,721, Cl. D15-148.000.

Sandspur Enterprises, Inc.: *See*—
Flynn, Mary E., 267,744, Cl. D24-31.000.

Sassmannshausen, Knut O. Bicycle light. 267,747, 1-25-83, Cl. D26-28.000.

Sassmannshausen, Knut O. Bicycle light. 267,748, 1-25-83, Cl. D26-28.000.
Savage, Milton B., deceased; Savage, Sara, executor; and Kane, Bernard D., executor. Lens display stand. 267,687, 1-25-83, Cl. D6-157.000.
Savage, Sara, executor: *See*—
Savage, Milton B., deceased; Savage, Sara, executor; and Kane, Bernard D., executor, 267,687, Cl. D6-157.000.
Schmidt, Dietrich F. Frame member for windows or the like. 267,746, 1-25-83, Cl. D25-74.000.
Schreiber, Rolf. Camera. 267,722, 1-25-83, Cl. D16-08.000.
Seeley, Wayne C., to Dentsply Research & Development Corp. Housing for a dental light instrument or the like. 267,745, 1-25-83, Cl. D24-10.000.
Shapiro, Jeffrey H., to A.B.L. Jewelers, Inc. Ring. 267,706, 1-25-83, Cl. D11-34.000.
Sidrak, Fahim R. Point plotting guide. 267,725, 1-25-83, Cl. D19-37.000.
Skarin, Lars, to Partex Fabriksaktiebolag. Combination of arrays of electrical wire markers in an insert and box arrangement. 267,700, 1-25-83, Cl. D9-337.000.
Societe Francaise d'Equipments pour La Navigation Aericnne (S.F.E.N.A.): *See*—
Dupuis, Jean-Claude; and Roudavitch, Georges, 267,721, Cl. D15-148.000.
Spencer, Gary: *See*—
Giebel, Charles; Rambo, Charles D.; and Spencer, Gary, 267,738, Cl. D21-217.000.
Staller, Norman D., to Polaroid Corporation. Clip-on sunglasses or similar article. 267,724, 1-25-83, Cl. D16-112.000.
Swann, James. Packaging container. 267,702, 1-25-83, Cl. D9-424.000.
Tajima, Osamu; Yamamura, Takashi; Mita, Yoichi; and Mochizuki, Masafumi, to Victor Company of Japan, Limited. Pre-recorded cartridge video/audio disk. 267,714, 1-25-83, Cl. D14-11.000.
Takenaka, Kazumasa: *See*—
Murakami, Shinzo; Takenaka, Kazumasa; Ohta, Kikuo; Hamada, Masanori; and Hoshino, Kunio, 267,717, Cl. D14-70.000.
Tamura Seisakusho Co., Ltd.: *See*—
Noda, Junichi; and Yanagisawa, Isao, 267,713, Cl. D13-24.000.
Thermomatics Associates, Ltd.: *See*—
McFarland, George E., 267,742, Cl. D23-127.000.
Thrush, James L., to Anchor Hocking Corporation. Beverage glass or similar article. 267,697, 1-25-83, Cl. D7-11.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hara, Kunio, 267,723, Cl. D16-28.000.
Tomoda, Hiroshi, to Dunlop Limited. Tire for a vehicle wheel. 267,712, 1-25-83, Cl. D12-136.000.
Tomy Corporation, Inc.: *See*—
Nuttall, Michael W.; and Lang, Karen, 267,729, Cl. D21-114.000.
'Totes', Incorporated: *See*—
Allen, James H., 267,675, Cl. D2-271.000.
Allen, James H., 267,676, Cl. D2-271.000.
Truette, Danny M.: *See*—
Leffler, Dennis F.; and Truette, Danny M., 267,680, Cl. D6-30.000.
Verdesca, Joseph T. Home computer table. 267,690, 1-25-83, Cl. D6-179.000.
Victor Company of Japan, Limited: *See*—
Tajima, Osamu; Yamamura, Takashi; Mita, Yoichi; and Mochizuki, Masafumi, 267,714, Cl. D14-11.000.
Vrignaud, Guy, to Allibert S.A. Wall hook. 267,685, 1-25-83, Cl. D6-120.000.
White, Courtney. Combined coffee table and book shelf unit. 267,691, 1-25-83, Cl. D6-179.000.
Wright, Forrest S. Barbell. 267,737, 1-25-83, Cl. D21-197.000.
Wright Line Inc.: *See*—
Moriarty, Frederick J.; and Paquette, Edmund T., 267,694, Cl. D6-191.000.
Paquette, Edmund T.; and Moriarty, Frederick J., 267,693, Cl. D6-191.000.
Paquette, Edmund T.; and Latino, Richard M., 267,695, Cl. D6-191.000.
Yamamura, Takashi: *See*—
Tajima, Osamu; Yamamura, Takashi; Mita, Yoichi; and Mochizuki, Masafumi, 267,714, Cl. D14-11.000.
Yanagisawa, Isao: *See*—
Noda, Junichi; and Yanagisawa, Isao, 267,713, Cl. D13-24.000.

# LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,978, Cl. 78.000.
Ewen, Alan D.: *See*—
Hengst, William E., 4,977, Cl. 38.000.
Hengst, William E., to Ewen, Alan D. Plum tree. 4,977, 1-25-83, Cl. 38.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,978, 1-25-83, Cl. 78.000.
Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,978, Cl. 78.000.

# CLASSIFICATION OF PATENTS

## ISSUED JANUARY 25, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

51 4,369,526
4,369,527
69 4,369,528
322 4,369,529

**CLASS 3**

1.7 4,369,530

**CLASS 4**

295 4,369,531
619 4,369,532

**CLASS 5**

61 4,369,533
475 4,369,534
481 4,369,535

**CLASS 8**

115.5 4,370,141
407 4,370,142
493 4,370,143
501 4,370,144
549 4,370,145

**CLASS 12**

1 A 4,369,536
142 RS 4,369,537

**CLASS 14**

89.5 4,369,538

**CLASS 15**

49 C 4,369,539
49 R 4,369,540
97 B 4,369,541
250 B 4,369,542
319 4,369,543
320 4,369,544

**CLASS 16**

64 4,369,545
110 R 4,369,546

**CLASS 17**

21 4,369,547

**CLASS 19**

26 4,369,548
145.7 4,369,549
240 4,369,550

**CLASS 24**

201 A 4,369,551
230 R 4,369,552
4,369,553

**CLASS 28**

101 4,369,554
221 4,369,555

**CLASS 29**

25.15 4,369,556
25.42 4,369,557
148.4 R 4,369,558
401.1 4,369,559
408 4,369,560
527.1 4,369,562
568 4,369,563
571 4,369,564
576 W 4,369,561
580 4,369,565
597 4,369,566
607 4,369,567
623.2 4,369,568
726 4,369,569
730 4,369,570
731 4,369,571
879 4,369,572

**CLASS 30**

105 4,369,573
123.5 4,369,574
151 4,369,575
228 4,369,576
276 4,369,577

**CLASS 33**

1 M 4,369,579
1 PT 4,369,578
42 4,369,580
169 C 4,369,581
180 R 4,369,582
403 4,369,583

**CLASS 34**

12 4,369,584
63 4,369,585
125 4,369,586
150 4,369,587

**CLASS 36**

9 R 4,369,588
77 R 4,369,589

**CLASS 37**

231 4,369,590

**CLASS 40**

610 4,369,591

**CLASS 42**

54 4,369,592
70 F 4,369,593
90 4,369,594

**CLASS 43**

83.5 4,369,595

**CLASS 44**

68 4,370,147

**CLASS 47**

1.5 4,369,596
9 4,369,597
66 4,369,598
74 4,369,599

**CLASS 49**

504 4,369,600

**CLASS 51**

135 BT 4,369,601
168 4,369,602
236 4,369,603
281 R 4,369,604
293 4,370,148
309 4,370,149
319 4,369,605
334 4,369,606
427 4,369,607

**CLASS 52**

309.9 4,369,608
478 4,369,609
509 4,369,610

**CLASS 53**

127 4,369,611
494 4,369,612
553 4,369,613
556 4,369,614

**CLASS 54**

24 4,369,615

**CLASS 55**

16 4,370,150
38 4,370,151
281 4,370,152
304 4,370,153
309 4,370,154
316 4,370,155

**CLASS 56**

11.3 4,369,616
14.6 4,369,617
295 4,369,618

**CLASS 57**

58.34 4,369,619
263 4,369,620
267 4,369,621
315 4,369,622

**CLASS 60**

39.12 4,369,624
39.6 4,369,...33
327 4,369,625
517 4,369,626
605 4,369,627
618 4,369,628
698 4,369,629
718 4,369,630

**CLASS 62**

17 4,370,156
82 4,369,631
4,369,632
117 4,369,633
126 4,369,634
260 4,369,635
514 R 4,369,636

**CLASS 65**

3.43 4,370,157
32 4,370,158

**CLASS 66**

8 4,369,637
148 4,369,638
203 4,369,639

**CLASS 68**

205 R 4,369,640

**CLASS 70**

272 4,369,641
389 4,369,642

**CLASS 71**

5 4,370,159
117 4,370,160

**CLASS 72**

75 4,369,643
92 4,369,644
201 4,369,645
243 4,369,646

**CLASS 73**

27 R 4,369,647
61.4 4,369,648
4,369,649
118 4,369,650
119 A 4,369,651
149 4,369,652
150 R 4,369,653
151 4,369,654
153 4,369,655
204 4,369,656
382 R 4,369,657
507 4,369,658
708 4,369,659
753 4,369,660
755 4,369,661
862.01 4,369,662
862.04 4,369,663
864.12 4,369,664
864.18 4,369,665

**CLASS 74**

7 R 4,369,666
191 4,369,667
414 4,369,668
422 4,369,669
513 4,369,670
665 GA 4,369,671
688 4,369,672
751 4,369,673
752 E 4,369,674
864 4,369,675
868 4,369,676
869 4,369,677

**CLASS 75**

34 4,370,161
90 R 4,370,162

**CLASS 81**

90 C 4,369,678

**CLASS 82**

4 R 4,369,679

**CLASS 83**

13 4,369,680
100 4,369,681
112 4,369,682
157 4,369,683
216 4,369,684
661 4,369,685
801 4,369,686

**CLASS 84**

454 4,369,687

**CLASS 86**

1 R 4,369,688
20 C 4,369,689

**CLASS 87**

33 4,369,690

**CLASS 89**

8 4,369,691
4,369,692

**CLASS 91**

35 4,369,693
368 4,369,694
375 A 4,369,695
465 4,369,696

**CLASS 99**

351 4,369,697
486 4,369,698

**CLASS 100**

156 4,369,699
215 4,369,700

**CLASS 101**

32 4,369,701
40 4,369,702
76 4,369,703
110 4,369,704
177 4,369,705
365 4,369,706

**CLASS 102**

202.13 4,369,708
202.2 4,369,707
229 4,369,709
289 4,369,710
324 4,369,711

**CLASS 104**

12 4,369,712
138 G 4,369,713
250 4,369,714

**CLASS 106**

35 4,370,165
97 4,370,166
119 4,370,167
177 4,370,168
267 4,370,169
277 4,370,170
300 4,370,171

**CLASS 108**

2 4,369,715
51.1 4,369,716

**CLASS 109**

45 4,369,717

**CLASS 110**

163 4,369,718
345 4,369,719

**CLASS 112**

79 A 4,369,720
98 4,369,721
103 4,369,722
281 4,369,723

**CLASS 114**

39 4,369,724
40 4,369,725
90 4,369,726
297 4,369,727

**CLASS 116**

276 4,369,728

**CLASS 118**

60 4,369,729
410 4,369,731
681 4,369,732
691 4,369,733
702 4,369,734
723 4,369,730

**CLASS 119**

3 4,369,735

**CLASS 123**

1 A 4,369,736
3 4,369,737
41.1 4,369,738
41.74 4,369,739
90.45 4,369,740
182 4,369,741
193 P 4,369,742
196 S 4,369,743
198 DC 4,369,745
198 E 4,369,744
261 4,369,746
278 4,369,747
425 4,369,748
439 4,369,749
505 4,369,750
527 4,369,751
568 4,369,752
569 4,369,753
573 4,369,754
588 4,369,755
620 4,369,756
4,369,757
4,369,758

**CLASS 124**

68 4,369,759

**CLASS 126**

21 A 4,369,760
63 4,369,761
164 4,369,762
276 4,369,763
400 4,369,764
427 4,369,765
429 4,369,766

**CLASS 127**

1 4,370,172

**CLASS 128**

6 4,369,767
4,369,768
69 4,369,769
4,369,770
79 4,369,771
92 C 4,369,772
127 4,369,773
133 4,369,774
166 4,369,775
200.14 4,369,776
4,369,777
205.13 4,369,778
213 A 4,369,779
214 E 4,369,780
214 R 4,369,781
249 4,369,782
260 4,369,783
271 4,369,784
276 4,369,785
318 4,369,787
321 4,369,788
419 P 4,369,791
479 4,369,792
643 4,369,793
671 4,369,794
736 4,369,795

**CLASS 131**

95 4,369,796
109 AB 4,369,797
330 4,369,798

**CLASS 132**

83 R 4,369,799

**CLASS 133**

8 R 4,369,800

**CLASS 134**

3 4,370,173
7 4,370,174
58 R 4,369,801
122 R 4,369,802

**CLASS 136**

244 4,370,509
262 4,370,510

**CLASS 137**

6 4,369,803
85 4,369,804
101.31 4,369,805
216 4,369,806
296 4,369,807
515.5 4,369,808
543.19 4,369,809
556 4,369,810
819 4,369,811
843 4,369,812

**CLASS 138**

94 4,369,813
120 4,369,814

**CLASS 139**

57 4,369,815
426 R 4,369,816
435 4,369,817
452 4,369,818

**CLASS 140**

105 4,369,819

**CLASS 141**

39 4,369,820
147 4,369,821

**CLASS 142**

1 Re.31,130

**CLASS 144**

286 R 4,369,822
340 4,369,823
343 4,369,824
34 B1 3,625,268

**CLASS 148**

1.5 4,370,175
4,370,176
6.27 4,370,177
12 F 4,370,178
175 4,370,179
187 4,370,180

**CLASS 149**

2 4,370,181

**CLASS 152**

157 4,369,825
410 4,369,826

**CLASS 156**

52 4,370,182
117 4,370,183
157 4,370,184
203 4,370,186
244.23 4,370,187
245 4,370,188
272.2 4,370,189
307.3 4,370,190
307.7 4,370,191
345 4,370,192
446 4,370,193
565 4,370,185
643 4,370,194
4,370,195
4,370,196
659.1 4,370,197

**CLASS 159**

48.1 4,370,198

**CLASS 160**

41 4,369,827
107 4,369,828
120 4,369,829

**CLASS 162**

161 4,370,199
210 4,370,200

**CLASS 164**

137 4,369,830
415 4,369,831
472 4,369,832

**CLASS 165**

67 4,369,833
104.16 4,369,834
154 4,369,835
171 4,369,836
175 4,369,837
185 4,369,838

**CLASS 166**

53 4,369,839
214 4,369,840
251 4,369,841
4,369,842
292 4,369,843
294 4,369,844
298 4,369,845

**CLASS 172**

60 4,369,846
815 4,369,847

**CLASS 173**

8 4,369,848

**CLASS 174**

14 R 4,370,511

18 4,370,512
21 JS 4,370,513
31 R 4,370,514
35 R 4,370,515
59 4,370,516
74 A 4,370,517
84 R 4,370,518

**CLASS 175**

340 4,369,849
393 4,369,850

**CLASS 178**

22.14 4,370,519

**CLASS 179**

1 DM 4,370,523
1 GD 4,370,522
1 GS 4,370,520
1 SC 4,370,521
15.55 T 4,370,524
16 A 4,370,525
51 AA 4,370,526
70 4,370,527

**CLASS 180**

6.66 4,369,851
117 4,369,853
148 4,369,852
201 4,369,854
212 4,369,855
321 4,369,856

**CLASS 181**

159 4,369,857

**CLASS 182**

134 4,369,858
179 4,369,859
214 4,369,860

**CLASS 187**

9 E 4,369,861

**CLASS 188**

73.45 4,369,862
106 A 4,369,863
277 4,369,864

**CLASS 192**

3.31 4,369,865
3.57 4,369,866
4 A 4,369,867
36 4,369,868
131 R 4,369,869

**CLASS 193**

23 4,369,870

**CLASS 198**

320 4,369,871
339 4,369,872
367 4,369,873
396 4,369,874
456 4,369,875
460 4,369,876
509 4,369,877
807 4,369,878

**CLASS 200**

6 BB 4,370,528
16 D 4,370,529
144 B 4,370,530
151 4,370,531
314 4,370,532
340 4,370,533

**CLASS 201**

1 4,370,201

**CLASS 202**

228 4,370,202
4,370,203

**CLASS 203**

39 4,370,204
75 4,370,205

**CLASS 204**

1 T 4,370,206
95 4,370,207
98 4,370,208
4,370,209
140 4,370,210
148 4,370,211
159.14 4,370,212
195 S 4,370,213
242 4,370,214
4,370,215
243 R 4,370,216
298 4,370,217

**CLASS 206**

45.18 4,369,879
63.3 4,369,880
225 4,369,881
232 4,369,882
387 4,369,883
389 4,369,884
484 4,369,885

**CLASS 208**

3 4,370,218
59 4,370,219
108 4,370,220
112 4,370,221
113 4,370,222
125 4,370,223
139 4,370,224

**CLASS 209**

40 4,370,225
332 4,370,226
564 4,369,886

**CLASS 210**

170 4,370,227
223 4,370,228
224 4,370,232
242.3 4,370,229
289 4,370,230
404 4,370,231
609 4,370,233
617 4,370,234
620 4,370,235
634 4,370,236
638 4,370,237
639 4,370,238
668 4,370,239
673 4,370,240
759 4,370,241
787 4,370,242

**CLASS 211**

49 D 4,369,887

**CLASS 215**

237 4,369,888
246 4,369,889

**CLASS 219**

10.55 A 4,370,534
10.55 B 4,370,535
69 M 4,370,536
69 V 4,370,537
121 EC 4,370,541
121 LH 4,370,542
121 LM 4,370,540
121 PW 4,370,539
121 PY 4,370,538
275 4,370,543
370 4,370,544
491 4,370,545
497 4,370,546
4,370,547
549 4,370,548

**CLASS 220**

85 R 4,369,890
85 VR 4,369,891
320 4,369,892
378 4,369,893
414 4,369,894

**CLASS 221**

3 4,369,895
75 4,369,896
227 4,369,897

**CLASS 222**

4 4,369,898
153 4,369,899
321 4,369,900
480 4,369,901

**CLASS 224**

42.42 4,369,902
213 4,369,903
250 4,369,904

**CLASS 226**

17 4,369,905
42 4,369,906

**CLASS 227**

54 4,369,907
90 4,369,908
109 4,369,909

**CLASS 228**

110 4,369,910
173 F 4,369,911

**CLASS 229**

5.6 4,369,912
30 4,369,913
33 4,369,914

**CLASS 235**

92 MP 4,370,549
449 4,370,550

**CLASS 236**

11 4,369,916

**CLASS 237**

12.1 4,369,917
55 4,369,918

**CLASS 239**

79 4,369,919
127.3 4,369,920
317 4,369,921
454 4,369,922
542 4,369,923
703 4,369,924
4,369,925

**CLASS 241**

18 4,369,926
73 4,369,927

**CLASS 242**

25 A 4,369,928
55.42 4,369,929
84.1 J 4,369,930
107 4,369,931
107.4 A 4,369,932
125.1 4,369,933
157.1 4,369,934
192 4,369,935
220 4,369,936

**CLASS 244**

3.21 4,369,940
53 R 4,369,937
135 R 4,369,938
155 R 4,369,939
118.5 B1 3,517,899

**CLASS 245**

2 4,369,941

**CLASS 246**

34 CT 4,369,942
127 4,369,943

**CLASS 248**

56 4,369,944
73 4,369,945
74 A 4,369,946
4,369,947
441 A 4,369,948
632 4,369,949
4,369,950

**CLASS 250**

201 4,370,551
253 4,370,552
343 4,370,553
491.1 4,370,554
503.1 4,370,556
554 4,370,557
559 4,370,558

**CLASS 251**

7 4,369,951

**CLASS 252**

8.55 D 4,370,243
39 4,370,244
46.4 4,370,245
4,370,246
46.7 4,370,247
49.6 4,370,248
62 4,370,249
135 4,370,250
186.42 4,370,251
311 4,370,252
312 4,370,253
355 4,370,254
389 A 4,370,255
391 4,370,256
429 B 4,370,257
429 R 4,370,258
437 4,370,259
438 4,370,260
460 4,370,261
464 4,370,262
472 4,370,263

**CLASS 254**

353 4,369,952

**CLASS 256**

24 4,369,953

**CLASS 260**

112 B 4,370,264
112.5 R 4,370,265
4,370,266
123.5 4,370,267
146 T 4,370,268
157 4,370,269
245.87 4,370,270
397.45 4,370,271
404 4,370,272
404.5 4,370,273
412.3 4,370,274
463 4,370,275
4,370,276
465 E 4,370,278
465 F 4,370,277
465.3 4,370,279
465.6 4,370,280
966 4,370,281

**CLASS 261**

34 B 4,370,282

**CLASS 264**

37 4,370,283
42 4,370,284
43 4,370,285
53 4,370,286
67 4,370,287
81 4,370,288
113 4,370,289
184 4,370,290
210.7 4,370,291
272.11 4,370,292
514 4,370,293
541 Re.31,133
571 4,370,294

**CLASS 266**

139 4,369,954
4,369,955

**CLASS 269**

34 4,369,956
41 4,369,957
61 4,369,958

**CLASS 271**

3.1 4,369,959
5 4,369,960
10 4,369,961
11 4,369,962
204 4,369,963
260 4,369,964

**CLASS 272**

56.5 R 4,369,965
62 4,369,966
119 4,369,967
123 4,369,968
144 4,369,969

**CLASS 273**

67 A 4,369,970
85 G 4,369,971
148 A 4,369,972
153 R 4,369,974
164 4,369,974
237 4,369,975
303 4,369,976

**CLASS 277**

1 4,369,977
12 4,369,978
212 FB 4,369,979
235 B 4,369,980

**CLASS 280**

5 A 4,369,981
47.13 R 4,369,982
81 A 4,369,983
166 4,369,984
641 4,369,985
644 4,369,986
4,369,987
689 4,369,988
763 4,369,989
804 4,369,990

**CLASS 285**

38 4,369,991
256 4,369,992

**CLASS 290**

1 R 4,370,559
40 C 4,370,560

**CLASS 292**

148 4,369,993
340 4,369,994

**CLASS 294**

89 Re.31,131

**CLASS 296**

65 A 4,369,995
97 K 4,369,996

**CLASS 297**

68 4,369,997
195 4,369,998
4,369,999
284 4,370,000
355 4,370,001
452 4,370,002

**CLASS 299**

2 4,370,003

**CLASS 307**

9 4,370,561
38 4,370,562
40 4,370,563
140 4,370,564
141 4,370,565
4,370,566
252 T 4,370,567
260 4,370,568
266 4,370,569
270 4,370,570
353 4,370,571
4,370,572
514 4,370,573
4,370,574
530 4,370,575

**CLASS 308**

10 4,370,004

**CLASS 310**

4,370,576
12 4,370,577
42 4,370,578
50 4,370,579
67 R 4,370,580
198 4,370,581
211 4,370,582
331 4,370,583
365 4,370,584

**CLASS 312**

215 4,370,006
334 4,370,007

**CLASS 313**

102 4,370,585
4,370,586
113 4,370,587
270 4,370,588
315 4,370,589
391 4,370,590
402 4,370,591
414 4,370,592
4,370,593
458 4,370,594
486 4,370,595

**CLASS 315**

3.6 4,370,596
58 4,370,597
59 4,370,598
217 4,370,599
244 4,370,600
307 4,370,601

**CLASS 318**

114 4,370,602
523 4,370,603
687 4,370,604
773 4,370,605

**CLASS 320**

35 4,370,606

**CLASS 323**

271 4,370,607
316 4,370,608

**CLASS 324**

51 4,370,609
52 4,370,610
61 R 4,370,611
117 R 4,370,612
154 R 4,370,613
173 4,370,614
457 4,370,615
458 4,370,616

**CLASS 328**

63 4,370,617
120 4,370,618
133 4,370,619

**CLASS 329**

192 4,370,620

**CLASS 330**

4 4,370,621
207 P 4,370,622
267 4,370,623
294 4,370,624

**CLASS 331**

49 4,370,625
96 4,370,626
108 D 4,370,627
111 4,370,628
179 4,370,629

**CLASS 333**

24 C 4,370,630
106 4,370,631
173 4,370,632
195 4,370,633

**CLASS 335**

16 4,370,634
20 4,370,635
132 4,370,636
174 4,370,637
186 4,370,638

**CLASS 336**

65 Re.31,134

**CLASS 337**

230 4,370,639

**CLASS 338**

25 4,370,640

**CLASS 339**

4 4,370,008
31 R 4,370,009
4,370,010
74 R 4,370,011
75 MP 4,370,012
82 4,370,013
97 P 4,370,015
97 R Re.31,132
4,370,014
103 M 4,370,016
176 MP 4,370,017
263 R 4,370,018

**CLASS 340**

146.3 H 4,370,641
347 SH 4,370,643
347 SY 4,370,642
528 4,370,644
709 4,370,645
722 4,370,646
784 4,370,647
825.2 4,370,648
825.35 4,370,649
825.71 4,370,650
825.86 4,370,651

**CLASS 343**

5 SM 4,370,652
6.5 LC 4,370,653
18 D 4,370,654
100 LE 4,370,655
112 D 4,370,656
700 MS 4,370,657
713 4,370,658
772 4,370,659
795 4,370,660

**CLASS 346**

74.5 4,370,661
75 4,370,662
4,370,663
4,370,664
4,370,665
76 PH 4,370,666
108 4,370,667
140 R 4,370,668

**CLASS 350**

6.6 4,370,019
96.10 4,370,020
96.18 4,370,021
96.21 4,370,022
96.23 4,370,023
162.12 4,370,024
163 4,370,026
164 4,370,027
166 4,370,025
341 4,370,028
355 4,370,029
358 4,370,030
426 4,370,031
476 4,370,032

**CLASS 351**

206 4,370,033
4,370,034

**CLASS 352**

78 R 4,370,035

**CLASS 354**

1 4,370,036
23 D 4,370,037
25 4,370,038
77 4,370,039
92 4,370,041
127 4,370,042
173 4,370,043
4,370,044
288 4,370,040
304 4,370,045
324 4,370,046

**CLASS 355**

3 BE 4,370,047
3 DD 4,370,049
4,370,056
3 R 4,370,051
3 SH 4,370,050
3 TR 4,370,048
14 D 4,370,053
14 R 4,370,052
14 SH 4,370,055
53 4,370,054

**CLASS 356**

71 4,370,057
125 4,370,058
400 4,370,059
417 4,370,060

**CLASS 357**

23 4,370,669
36 4,370,670
79 4,370,671

**CLASS 358**

21 R 4,370,673
74 4,370,674
108 4,370,675
188 4,370,676
225 4,370,677
285 4,370,678
312 4,370,672
318 4,370,679
330 4,370,680

**CLASS 360**

68 4,370,681
71 4,370,682
73 4,370,683
74.2 4,370,684
77 4,370,685
96.3 4,370,686
98 4,370,687
99 4,370,688
135 4,370,689

**CLASS 361**

23 4,370,690
62 4,370,691
109 4,370,692
145 4,370,693
179 4,370,694
213 4,370,695
232 4,370,696
283 4,370,697
330 4,370,698
406 4,370,699
424 4,370,700
384 B1 4,122,508

**CLASS 363**

20 4,370,701
42 4,370,702
136 4,370,703

**CLASS 364**

171 4,370,704
184 4,370,705
4,370,706
200 4,370,707
4,370,708
4,370,709
4,370,710
4,370,711
4,370,712
4,370,729
424 4,370,713
426 4,370,714
4,370,715
434 4,370,716
436 4,370,717
4,370,718
472 4,370,719
474 4,370,720
4,370,721
4,370,722
483 4,370,723
561 4,370,724
582 4,370,725
604 4,370,726
705 4,370,727
900 4,370,728
4,370,730
4,370,731
4,370,732
4,370,733

**CLASS 365**

12 4,370,734
16 4,370,735
155 4,370,736
203 4,370,737

**CLASS 366**

85 4,370,061
130 4,370,062

**CLASS 368**

71 4,370,063
93 4,370,064
157 4,370,065
188 4,370,066
202 4,370,067
240 4,370,068
273 4,370,069

**CLASS 369**

77 4,370,738
126 4,370,739
276 4,370,740

**CLASS 370**

24 4,370,741
58 4,370,742
67 4,370,743
88 4,370,744

**CLASS 371**

8 4,370,745
27 4,370,746

**CLASS 374**

170 4,370,070

**CLASS 375**

62 4,370,747
94 4,370,748
99 4,370,749

**CLASS 376**

133 4,370,295
4,370,296
148 4,370,297
317 4,370,298

**CLASS 378**

43 4,370,750
47 4,370,751
110 4,370,752
120 4,370,555

**CLASS 384**

154 4,370,005

**CLASS 400**

144.2 4,370,071

**CLASS 401**

276 4,370,072

**CLASS 403**

172 4,370,073
388 4,370,074

**CLASS 405**

20 4,370,075
132 4,370,076
258 4,370,077
264 4,370,078
272 4,370,079

**CLASS 409**

200 4,370,080

**CLASS 411**

43 4,370,081
61 4,370,082
87 4,370,083

**CLASS 414**

292 4,370,084
337 4,370,085
4,370,086
421 4,370,087
439 4,370,088
589 4,370,089
694 4,370,090
735 4,370,091
752 4,370,092
779 4,370,093

**CLASS 415**

172 A 4,370,094

**CLASS 416**

175 4,370,095
189 4,370,096
228 4,370,097

**CLASS 417**

18 4,370,098
32 4,370,099
218 4,370,100
241 4,370,101
296 4,370,102
298 4,370,103
312 4,370,104
360 4,370,105
407 4,370,106
413 4,370,107
430 4,370,108

**CLASS 418**

34 4,370,109
132 4,370,110
212 4,370,111

**CLASS 420**

429 4,370,299
503 4,370,164
582 4,370,163

**CLASS 422**

108 4,370,300
122 4,370,301
137 4,370,302
144 4,370,303
224 4,370,304
292 4,370,305

**CLASS 423**

220 4,370,306
432 4,370,307
450 4,370,308
461 4,370,309
600 4,370,310

**CLASS 424**

1.1 4,370,311
1.5 4,370,312
32 4,370,313
54 4,370,314
94 4,370,315
98 4,370,316
177 4,370,317
4,370,318
184 4,370,319
200 4,370,320
243 4,370,321
4,370,322
244 4,370,323
4,370,324
245 4,370,325
246 4,370,326
4,370,327
250 4,370,328
4,370,329
4,370,330
258 4,370,331
4,370,332
260 4,370,333
266 4,370,334
267 4,370,335
269 4,370,336
4,370,337
270 4,370,338
273 P 4,370,339
274 4,370,340
4,370,341
275 4,370,342
4,370,343
279 4,370,344
282 4,370,345
305 4,370,346
324 4,370,347
331 4,370,348
365 4,370,349

**CLASS 425**

3 4,370,112
13 4,370,113
131.5 4,370,114
144 4,370,115
171 4,370,116
224 4,370,117
305.1 4,370,118
352 4,370,119
405 H 4,370,120
526 4,370,121
543 4,370,122
4,370,123
556 4,370,124

**CLASS 426**

5 4,370,350
7 4,370,351
557 4,370,352
570 4,370,353
573 4,370,354

**CLASS 427**

9 4,370,355
38 4,370,356
46 4,370,357
54.1 4,370,358
63 4,370,359
76 4,370,360
123 4,370,361
153 4,370,362
230 4,370,363
238 4,370,364
387 4,370,365
389.9 4,370,366
423 4,370,367

**CLASS 428**

35 4,370,368
4,370,369
40 4,370,370
65 4,370,371
116 4,370,372
151 4,370,373
216 4,370,374
229 4,370,375
241 4,370,376
327 4,370,377
339 4,370,378
341 4,370,379
355 4,370,380
392 4,370,381
418 4,370,382
425.9 4,370,383
4,370,384
429 4,370,385
458 4,370,386
4,370,387
461 4,370,388
511 4,370,389
614 4,370,390
697 4,370,391
451 B1 3,328,231

**CLASS 429**

15 4,370,392
193 4,370,393
199 4,370,394
219 4,370,395

**CLASS 430**

7 4,370,396
10 4,370,397
42 4,370,398
58 4,370,399
126 4,370,400
178 4,370,401
237 4,370,402
271 4,370,403
302 4,370,404
312 4,370,405
331 4,370,406
403 4,370,407
432 4,370,408
496 4,370,409
505 4,370,410
596 4,370,411
635 4,370,412

**CLASS 431**

66 4,370,125
73 4,370,126

**CLASS 432**

106 4,370,127
115 4,370,128

**CLASS 433**

6 4,370,129
32 4,370,130
86 4,370,131
128 4,370,132
171 4,370,133
173 4,370,134
213 4,370,135
217 4,370,136

**CLASS 434**

94 4,370,137

**CLASS 435**

39 4,370,413
44 4,370,414
119 4,370,415
197 4,370,416
212 4,370,417
256 4,370,420
289 4,370,418
301 4,370,419

**CLASS 436**

120 4,370,146

**CLASS 440**

112 4,370,138

**CLASS 455**

36 4,370,753

**CLASS 474**

45 4,370,139

**CLASS 493**

289 4,370,140

**CLASS 494**

8 4,369,915

**CLASS 501**

88 4,370,421
108 4,370,422

**CLASS 521**

84 4,370,423
121 4,370,424
138 4,370,425

**CLASS 523**

310 4,370,426
400 4,370,427
508 4,370,428

**CLASS 524**

60 4,370,429
96 4,370,430
100 4,370,431
216 4,370,432
274 4,370,433
289 4,370,434
312 4,370,435
322 4,370,436
397 4,370,437
412 4,370,438
513 4,370,439
522 4,370,440
539 4,370,441
598 4,370,442
612 4,370,443
732 4,370,444
742 4,370,445

**CLASS 525**

36 4,370,446
39 4,370,447
99 4,370,448
247 4,370,449
262 4,370,450
294 4,370,451
438 4,370,452
450 4,370,453

**CLASS 526**

88 4,370,454
125 4,370,455
4,370,456
137 4,370,457
138 4,370,458
227 4,370,459
329.2 4,370,460

**CLASS 528**

45 4,370,461
73 4,370,462
78 4,370,463
99 4,370,464
104 4,370,465
190 4,370,466
322 4,370,467
335 4,370,468
388 4,370,469
4,370,470
4,370,471

**CLASS 536**

1.1 4,370,472
2 4,370,473
6.4 4,370,474
16.8 4,370,475
113 4,370,476

**CLASS 542**

413 4,370,477
427 4,370,478

**CLASS 544**

278 4,370,479
320 4,370,480

**CLASS 546**

251 4,370,481

**CLASS 548**

155 4,370,482
165 4,370,483
316 4,370,484
404 4,370,485

**CLASS 549**

46 4,370,486
242 4,370,487
429 4,370,488

**CLASS 560**

62 4,370,489
214 4,370,490
234 4,370,491
245 4,370,492

**CLASS 562**

444 4,370,493
450 4,370,494
451 4,370,495
487 4,370,496

**CLASS 564**

55 4,370,497
155 4,370,498
200 4,370,499
304 4,370,500
330 4,370,501
411 4,370,502
474 4,370,503

**CLASS 568**

454 4,370,504
734 4,370,505
785 4,370,506
902 4,370,507

**CLASS 585**

467 4,370,508

**CLASS 604**

96 4,369,789
280 4,369,790
390 4,369,786

## CLASSIFICATION OF DESIGNS

D2— 28 267,674
271 267,675
267,676
D3— 71 267,677
D6— 7 267,678
20 267,679
30 267,680
73 267,681
85 267,682
267,683
97 267,684
120 267,685
127 267,686
157 267,687
162 267,688
169 267,689
179 267,690
267,691
186 267,692
191 267,693
267,694
267,695
264 267,696
D7— 11 267,697
D8— 341 267,698
380 267,699
D9— 337 267,700
372 267,701
424 267,702
435 267,703
D10— 6 267,704
39 267,705
D11— 34 267,706
48 267,707
157 267,708
D12— 96 267,709
103 267,710
133 267,711
136 267,712
D13— 24 267,713
D14— 11 267,714
60 267,715
267,716
70 267,717
D15— 7 267,718
21 267,719
130 267,720
148 267,721
D16— 08 267,722
28 267,723
112 267,724
D19— 37 267,725
59 267,726
D21— 75 267,727
104 267,728
114 267,729
182 267,730
267,731
267,732
267,733
267,734
267,735
267,736
197 267,737
217 267,738
234 267,739
D22— 18 267,740
D23— 94 267,741
127 267,742
D24— 10 267,745
31 267,744
53 267,743
D25— 74 267,746
D26— 28 267,747
267,748
D28— 76 267,749
D30— 34 267,750
D32— 1 267,751

## CLASSIFICATION OF PLANTS

P.— 38 4,977
78 4,978

# GEOGRAPHICAL INDEX

# OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1 | Kentucky | 21 | Oregon | 41 |
| Alaska | 2 | Louisiana | 22 | Pennsylvania | 42 |
| American Samoa | 3 | Maine | 23 | Puerto Rico | 43 |
| Arizona | 4 | Maryland | 24 | Rhode Island | 44 |
| Arkansas | 5 | Massachusetts | 25 | South Carolina | 45 |
| California | 6 | Michigan | 26 | South Dakota | 46 |
| Canal Zone | 7 | Minnesota | 27 | Tennessee | 47 |
| Colorado | 8 | Mississippi | 28 | Texas | 48 |
| Connecticut | 9 | Missouri | 29 | Utah | 49 |
| Delaware | 10 | Montana | 30 | Vermont | 50 |
| District of Columbia | 11 | Nebraska | 31 | Virginia | 51 |
| Florida | 12 | Nevada | 32 | Virgin Islands | 52 |
| Georgia | 13 | New Hampshire | 33 | Washington | 53 |
| Guam | 14 | New Jersey | 34 | West Virginia | 54 |
| Hawaii | 15 | New Mexico | 35 | Wisconsin | 55 |
| Idaho | 16 | New York | 36 | Wyoming | 56 |
| Illinois | 17 | North Carolina | 37 | U.S. Air Force | 57 |
| Indiana | 18 | North Dakota | 38 | U.S. Army | 58 |
| Iowa | 19 | Ohio | 39 | U.S. Navy | 59 |
| Kansas | 20 | Oklahoma | 40 | | |


(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

01 : 4,369,526
4,369,673
4,369,711
4,369,766
4,369,966
4,370,095
4,370,153
4,370,750
04 : 4,369,699
4,369,742
4,369,773
4,370,288
4,370,573
4,370,574
4,370,700
05 : 4,369,594
06 : 4,369,530
4,369,564
4,369,585
4,369,589
4,369,591
4,369,600
4,369,626
4,369,629
4,369,636
4,369,642
4,369,657
4,369,661
4,369,685
4,369,690
4,369,697
4,369,754
4,369,782
4,369,799
4,369,802
4,369,806
4,369,857
4,369,876
4,369,879
4,369,884
4,369,886
4,369,913
4,369,948
4,369,963
4,369,971
4,369,991
4,369,996
4,370,029
4,370,030
4,370,081
4,370,083
4,370,087
4,370,152

4,370,159
4,370,174
4,370,175
4,370,182
4,370,183
4,370,192
4,370,219
4,370,223
4,370,239
4,370,242
4,370,246
4,370,274
4,370,405
4,370,459
4,370,484
4,370,485
4,370,493
4,370,501
4,370,510
4,370,547
4,370,550
4,370,559
4,370,569
4,370,572
4,370,576
4,370,602
4,370,615
4,370,620
4,370,631
4,370,646
4,370,652
4,370,654
4,370,656
4,370,657
4,370,679
4,370,688
4,370,689
4,370,696
4,370,714
4,370,720
4,370,728
4,370,729
4,370,730
4,370,734
4,370,737
08 : 4,369,735
4,369,821
4,369,841
4,369,842
4,369,846
4,369,868
4,369,976
4,370,003

4,370,101
4,370,238
4,370,525
4,370,641
4,370,723
4,370,733
09 : 4,369,531
4,369,575
4,369,630
4,369,643
4,369,665
4,369,680
4,369,705
4,369,832
4,369,909
4,369,929
4,369,998
4,370,015
4,370,070
4,370,097
4,370,303
4,370,361
4,370,402
4,370,409
4,370,482
4,370,500
4,370,540
4,370,718
10 : 4,369,653
4,369,779
4,370,061
4,370,212
4,370,354
4,370,466
4,370,479
4,370,480
4,370,503
12 : Re.31,130
4,369,551
4,369,559
4,369,570
4,369,571
4,369,611
4,369,616
4,369,635
4,369,684
4,369,693
4,369,727
4,369,737
4,369,751
4,369,772
4,369,890
4,369,914

4,369,922
4,369,993
4,370,009
4,370,062
4,370,107
4,370,155
4,370,372
4,370,418
4,370,648
4,370,659
4,370,677
4,370,753
13 : 4,369,609
4,369,640
4,369,681
4,369,715
4,369,765
4,369,959
4,370,075
4,370,117
4,370,351
4,370,355
16 : 4,370,249
17 : Re.31,132
4,369,546
4,369,590
4,369,614
4,369,651
4,369,768
4,369,826
4,369,833
4,369,888
4,369,889
4,369,895
4,369,901
4,369,980
4,369,982
4,369,995
4,370,064
4,370,080
4,370,092
4,370,125
4,370,205
4,370,267
4,370,272
4,370,298
4,370,311
4,370,324
4,370,339
4,370,350
4,370,399
4,370,406
4,370,417

4,370,441
4,370,457
4,370,518
4,370,531
4,370,532
4,370,560
4,370,630
4,370,674
4,370,675
4,370,695
4,370,707
4,370,743
4,370,748
18 : 4,369,606
4,369,627
4,369,700
4,369,750
4,369,822
4,369,861
4,369,870
4,370,106
4,370,139
4,370,171
4,370,321
4,370,566
4,370,669
4,370,738
19 : 4,369,595
4,369,728
4,369,856
4,369,927
4,369,965
4,370,090
4,370,515
4,370,622
4,370,701
20 : 4,369,899
4,370,234
21 : 4,369,942
4,370,218
4,370,273
4,370,692
22 : 4,369,633
4,370,220
4,370,224
4,370,278
23 : 4,370,012
4,370,017
24 : 4,369,577
4,369,764
4,369,769
4,369,792
4,369,798

4,369,811
4,370,199
4,370,260
4,370,423
4,370,604
4,370,621
25 : 4,369,527
4,369,556
4,369,557
4,369,659
4,369,725
4,369,776
4,369,812
4,369,937
4,370,035
4,370,045
4,370,063
4,370,116
4,370,194
4,370,308
4,370,333
4,370,356
4,370,369
4,370,380
4,370,513
4,370,570
4,370,596
4,370,613
4,370,693
4,370,712
4,370,751
26 : 4,369,541
4,369,588
4,369,613
4,369,631
4,369,632
4,369,667
4,369,677
4,369,730
4,369,793
4,369,795
4,369,867
4,369,887
4,369,916
4,369,918
4,369,949
4,369,950
4,369,956
4,369,957
4,369,972
4,369,992
4,370,002
4,370,008

4,370,085
4,370,086
4,370,099
4,370,108
4,370,130
4,370,160
4,370,216
4,370,255
4,370,297
4,370,344
4,370,507
4,370,546
4,370,553
27 : 4,369,539
4,369,582
4,369,601
4,369,607
4,369,760
4,369,791
4,369,829
4,369,855
4,370,073
4,370,164
4,370,184
4,370,401
4,370,557
4,370,600
4,370,650
4,370,658
4,370,690
4,370,711
29 : 4,369,534
4,369,547
4,369,605
4,369,617
4,369,781
4,369,850
4,369,896
4,369,897
4,369,940
4,370,390
30 : 4,369,596
31 : 4,369,894
32 : 4,370,105
33 : 4,369,987
4,370,538
4,370,708
34 : 4,369,569
4,369,604
4,369,687
4,369,688
4,369,701
4,369,702
4,369,708
4,369,878
4,369,943
4,369,944
4,370,133

4,370,141
4,370,146
4,370,165
4,370,196
4,370,222
4,370,243
4,370,248
4,370,250
4,370,251
4,370,314
4,370,348
4,370,359
4,370,382
4,370,430
4,370,432
4,370,438
4,370,451
4,370,508
4,370,520
4,370,521
4,370,561
4,370,568
4,370,583
4,370,589
4,370,594
4,370,597
4,370,640
4,370,653
4,370,672
4,370,706
4,370,726
4,370,739
4,370,745
35 : 4,369,903
4,370,077
36 : Re.31,131
4,369,552
4,369,573
4,369,623
4,369,634
4,369,724
4,369,732
4,369,787
4,369,789
4,369,790
4,369,794
4,369,880
4,369,882
4,369,883
4,369,885
4,369,902
4,369,938
4,369,958
4,369,962
4,370,010
4,370,014
4,370,047

4,370,056
4,370,111
4,370,121
4,370,122
4,370,123
4,370,124
4,370,131
4,370,135
4,370,147
4,370,167
4,370,195
4,370,197
4,370,215
4,370,284
4,370,313
4,370,358
4,370,367
4,370,400
4,370,407
4,370,411
4,370,412
4,370,494
4,370,519
4,370,530
4,370,552
4,370,563
4,370,590
4,370,609
4,370,616
4,370,642
4,370,651
4,370,655
4,370,661
4,370,663
4,370,732
4,370,746
37 : 4,369,528
4,369,796
4,370,169
4,370,516
4,370,635
39 : 4,369,540
4,369,548
4,369,666
4,369,678
4,369,745
4,369,775
4,369,786
4,369,801
4,369,860
4,369,871
4,369,892
4,369,912
4,369,973
4,369,974
4,369,983
4,369,985

4,370,006
4,370,024
4,370,104
4,370,110
4,370,178
4,370,189
4,370,233
4,370,286
4,370,307
4,370,319
4,370,375
4,370,378
4,370,392
4,370,428
4,370,434
4,370,435
4,370,443
4,370,452
4,370,463
4,370,665
4,370,702
4,370,721
40 : Re.31,134
4,369,555
4,369,803
4,369,840
4,369,844
4,370,150
4,370,156
4,370,166
4,370,170
4,370,236
4,370,252
4,370,259
4,370,309
4,370,310
4,370,437
4,370,448
4,370,471
41 : 4,369,597
4,369,762
4,370,433
42 : 4,369,576
4,369,618
4,369,624
4,369,662
4,369,691
4,369,692
4,369,763
4,369,785
4,369,810
4,369,813
4,369,893
4,369,933
4,369,968
4,370,018
4,370,022

4,370,036
4,370,072
4,370,136
4,370,140
4,370,143
4,370,157
4,370,161
4,370,173
4,370,177
4,370,201
4,370,206
4,370,209
4,370,240
4,370,245
4,370,253
4,370,287
4,370,294
4,370,325
4,370,335
4,370,343
4,370,357
4,370,373
4,370,427
4,370,439
4,370,511
4,370,512
4,370,529
4,370,585
4,370,586
4,370,592
4,370,593
4,370,603
4,370,605
4,370,649
4,370,662
4,370,713
4,370,717
45 : 4,369,592
4,369,622
4,369,712
4,369,723
4,369,761
4,370,093
47 : 4,369,720
4,369,858
4,370,214
48 : 4,369,580
4,369,612
4,369,615
4,369,654
4,369,655
4,369,807
4,369,839
4,369,843
4,369,849
4,369,851
4,369,977

4,369,989
4,369,994
4,370,071
4,370,098
4,370,103
4,370,120
4,370,256
4,370,461
4,370,465
4,370,470
4,370,575
4,370,625
4,370,628
4,370,629
4,370,632
4,370,645
4,370,647
4,370,694
4,370,709
49 : 4,369,774
4,369,904
51 : 4,369,532
4,369,549
4,369,788
4,370,295
4,370,296
4,370,442
4,370,534
4,370,611
4,370,636
4,370,719
53 : 4,369,598
4,369,679
4,369,970
4,370,181
4,370,231
54 : 4,370,376
4,370,456
55 : 4,369,568
4,369,584
4,369,586
4,369,660
4,369,719
4,369,731
4,369,743
4,369,771
4,369,827
4,369,828
4,369,835
4,369,921
4,370,084
4,370,129
4,370,299
4,370,528
4,370,703
56 : 4,369,778
4,370,225

## DESIGN PATENTS

04 : 267,738
06 : 26..,678
267,691
267,699
267,710
267,719
267,729
267,742
267,743
09 : 267,688

267,689
12 : 267,744
17 : 267,715
267,716
18 : 267,709
267,739
21 : 267,675
267,676
23 : 267,740
25 : 267,693

267,694
267,695
267,704
267,724
26 : 267,679
267,707
267,737
27 : 267,730
267,731
267,732

267,733
267,734
267,735
267,736
31 : 267,718
32 : 267,698
34 : 267,677
267,706
267,751

36 : 267,682
267,683
267,687
267,692
267,696
267,701
267,703
267,726
267,727

37 : 267,680
267,725
39 : 267,697
42 : 267,745
267,746
44 : 267,741
48 : 267,686
267,690
267,708

## PLANT PATENTS

06 : 4,977

4,978

U.S. GOVERNMENT PRINTING OFFICE : O—1983

## CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

---

## SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402